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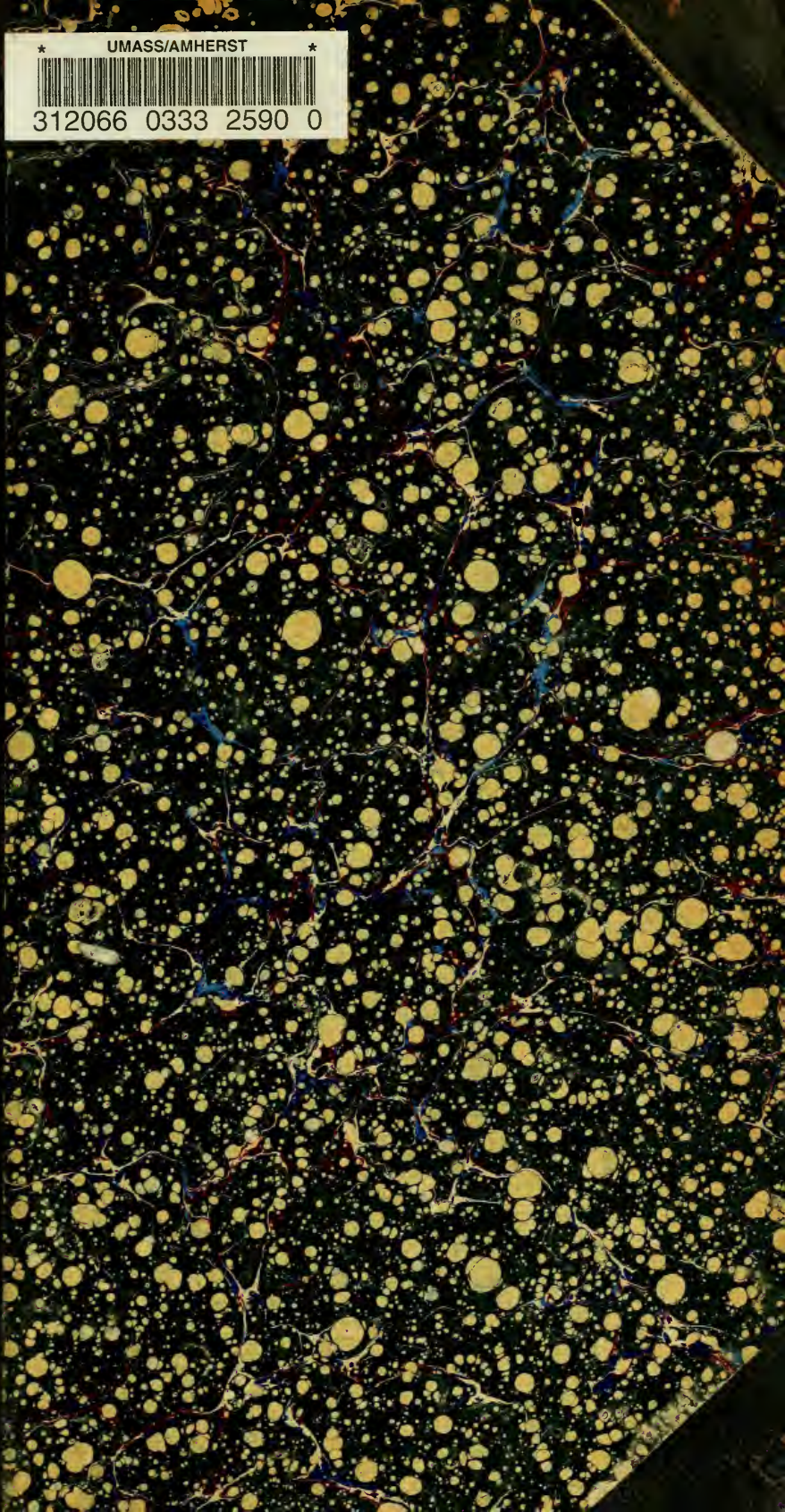

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MASSACHUSETTS

CROP REPORT

FOR THE

MONTH OF MAY, 1897.

ISSUED BY

WM. R. SESSIONS,

SECRETARY STATE BOARD OF AGRICULTURE.

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Crop Report for the Month of May, 1897.

Office of State Board of Agriculture,
Boston, Mass., June 1, 1897.

In Bulletin No. 1, Crop Report for the month of May, we present the first of our series of monthly crop bulletins for the current year. The general style and plan of these bulletins will be much as in former years, but we shall endeavor to issue them more nearly at the close of the month than has been the case for several seasons past. Contrary to the custom of the several preceding years, the weekly weather-crop bulletins of the Weather Bureau will not be sent to those on our mailing list. Any one desiring to receive these bulletins should send his name and address to J. W. Smith, local forecast official, Weather Bureau, Post-office Building, Boston. As in former years, a short article by some specialist of the Board or some other scientist of standing will be included in each issue. This bulletin contains an article on "Small fruits in the home garden," by Prof. S. T. Maynard, botanist and pomologist of this Board.

Report on Farm Animals.

Report No. 145 of the Department of Agriculture states that the decline in the number of horses, first noticed in 1894, still continues, having amounted to 5 per cent in 1896. The principal cause of the decrease in numbers is found in the disappearance of inducements to breeding caused by the low price of these animals. This fall in price is, however, less marked than in previous years, having in turn been checked by the decrease in the number of animals. The reasons found for the depression of this branch of animal industry are the substitution of electric motors for horse-power in many directions, the increasing use of the bicycle, and the

over-production of cheap animals on the great ranges of the western States.

Mules have naturally followed horses in diminishing price and number, but have not proceeded so rapidly in either case. The number of mules did not reach the maximum until 1895, several years later than with horses, and has since then fallen only 6.2 per cent, as against 9.6 per cent for horses.

Little change in the number of milch cows is reported from the Atlantic States, but the north central region shows some diminution. West of this region there is generally a continued increase, due to increased interest in the dairy industry. Prices are slightly lower in most of the eastern and some of the central States, but west of the Mississippi milch cows are in demand at prices generally higher than prevailed a year ago.

Oxen and other cattle have decreased one-sixth in number since 1894. The use of oxen has fallen off because of the cheapness of horses, and "other cattle" have declined in number because of the financial depression. This decrease in number has been accompanied by some improvement in price, due to the increasing demand for beef, as related to the supply.

With some local increases, there is a general falling off in the number of sheep throughout the country, the lower price of wool being the cause usually assigned for it. The price shows a prevailing tendency to improve, usually explained as due to the increased mutton demand. Losses from dogs amounted to 1.1 per cent of the whole number, or a little over a quarter of a million sheep altogether.

Swine decreased 5.2 per cent in number during the year 1896, due mostly to severe attacks of cholera in regions of large production. Along with this there has been a further fall of 25 cents in average price per head, the two factors resulting in an aggregate loss of $20,000,000.

On Jan. 1, 1897, there were estimated to be 14,364,667 horses on farms and ranches in the United States, valued at $452,649,396; 2,215,654 mules, valued at $92,302,090; 15,941,727 milch cows, valued at $369,239,993; 30,508,408 oxen and other cattle, valued at $507,929,421; 36,818,643

sheep, valued at $67,020,942; 40,600,276 swine, valued at $166,272,770; total value of farm animals, $1,655,414,612, as against $1,727,926,084 in 1896.

The number of horses on farms in Massachusetts was 63,800; average price, $64.67; value, $4,125,916. Milch cows, 172,826; average price, $30.78; value, $5,319,584. Oxen and other cattle, 75,647; average price, $24.33; value, $1,840,485. Sheep, 42,104; average price, $3.38; value, $142,206. Swine, 58,297; average price, $8.44; value, $492,025.

Progress of the Season.

The May returns of the United States Department of Agriculture (Report No. 148) show a decline in the condition of winter wheat of 1.2 points from the April average, being 80.2, against 81.4 last month and 82.7 in May, 1896. The worst injuries from freezing and deficient snow are reported in the north central States. The conditions in European countries are generally not quite as good as last year.

The condition of barley is high, — 96.4 this year, against 89.2 in 1896 and 94 in 1895, at same date. The average condition of rye is 88, against 88.9 in April and 87.7 in May last year. The lowest figures are found in the same States giving the lowest wheat figures, but are considerably less depressed.

The average condition of meadows is 93.4, against 91.8 a year ago and 89.4 in 1895. This exceptionally high condition is general. Wherever low figures are reported the condition is usually attributed to the late season.

The average condition of pastures is 93.4, against 93.2 a year ago and 89.7 in 1895. There are many complaints that pasturage is backward, owing to the prevailing low temperature, but the general average is higher than has been reached for a number of years.

Farmers are behind with their spring ploughing, as a rule, in all sections of the country except along the northern half of the Atlantic coast, and in Texas, New Mexico and Oklahoma. The loss of time in the other States is attributed chiefly to excessive rains and the late season.

The extent of the proposed breadth of cotton already planted on the first day of May was 81.9, against 87.9 per cent last year and 88.3 per cent usually planted at this date. Much of the early cotton was killed by the frosts, making replanting necessary.

Weather Summary, January to April, 1897.

[Furnished by the Weather Bureau, Boston.]

January averaged warmer than usual, except along the south-eastern coast, where slight deficiencies in temperature occurred. The mean monthly temperature was 26.8°, a departure above the normal of 1.6°. A warm spell prevailed from the 3d to 5th inclusive, with the maxima ranging in the fifties. Winter temperatures were then the rule until the middle of the month. A most pronounced cold wave set in on the 19th. This produced remarkable temperature falls, averaging 40° to 60°. By the 21st the weather was again moderate and so continued. The storm of the 5th gave general heavy rains; that of the 17th and 18th was also mostly rain. The storm of the 20th and 21st began as snow, but changed to rain. There was little snow during the month until the great storm of the 28th. This was a typical coast storm. Its centre passed Boston about 1 P.M. of the 28th. From 12 to 18 inches of snow fell and the month closed with a large body on the ground.

February was an agreeable change from the severe weather conditions which generally characterize the month. Heavy storms were not numerous. The mean monthly temperature was higher than the normal by 2°. There were only two pronounced cold waves. Zero weather was almost steady throughout the first six mornings in all but coast sections. During the second decade and the greater part of the third the mercury went below zero but few times, although the closing days brought a cold spell. There were numerous mild, spring-like days, and the general conditions presented a marked contrast to those of the same month in 1896. The precipitation averaged a departure below the normal of 0.95 inch. A good snow covering protected the ground. The snowfall averaged 13 inches.

March was a stormy, disagreeable month, although it is true that there was no great storm. In the first half of the month precipitation was measured on nine days, but the storms were moderate. Fair weather prevailed from the 15th to 18th, followed by the second storm period, which lasted until the 27th, with heavy rains on the 24th. The closing days were fair and remarkably pleasant. The precipitation was but slightly below normal. The average snowfall was but 4 inches. At the end of the month the ground was bare and rivers and ponds were in general free from ice. The month opened with a temperature ranging nearly as low as on any day of the winter. Low morning temperatures continued through the first ten days, and another cold period prevailed from the 13th to 18th. From the 18th to the close of the month the weather was almost uniformly mild.

The monthly mean temperature for April was above the normal by 2.3°. The highest temperatures were mainly recorded on the 25th and were above 80° as a rule. The feature of the month with regard to this element was the sudden and most decided fall on the 20th, amounting almost to a cold wave. South-westerly winds on the 19th made that a mild day, but all the time a large body of cold air was proceeding eastward from the lake regions, following closely in the rear of a storm which was moving down the St. Lawrence valley. By the morning of the 20th the fall in temperature amounted to from 40° to 50°, and the mercury registered below freezing all over the State. The cold was all the more bitter for being so unseasonable. No particular damage was caused by this freeze, as vegetation had not advanced sufficiently.

Temperature and Rainfall for the Whole Country.

[From United States Weather-Crop Bulletins.]

Week ending May 10. — Week slightly cooler than usual in the South Atlantic and east Gulf States and over portions of the Middle States and New England. Elsewhere generally over the country the week averaged warmer than usual. More than the usual amount of rain fell over limited areas in

the lake regions and in the south-west, but over the whole country the week was drier than usual, the deficiency of rainfall exceeding half an inch in some sections. Corn planting was pushed rapidly during the week. Winter wheat continued to improve. Spring wheat seeding was practically completed. Cotton did not make favorable progress.

Week ending May 17. — The week averaged cooler than usual throughout the central valleys and the middle portion of the Gulf States. Elsewhere generally over the country the week averaged slightly warmer than usual. More than the average amount of rain fell throughout the Atlantic coast districts and in the west Gulf States. Throughout the Missouri and upper Mississippi valleys and over the greater part of the lake regions the rainfall was below the normal. Week generally favorable. Corn planting well under way. Cotton showed an improvement in condition. Winter wheat continued in promising condition and spring wheat seeding was completed.

Week ending May 24. — Week slightly cooler than usual on the south Atlantic coast and over portions of Ohio valley, lake region, and northern New England. Warmer than usual throughout the Mississippi valley and from the Missouri valley westward over the northern Rocky Mountain and plateau regions. Elsewhere temperature nearly normal. Over much the greater part of the country the week was drier than usual. In the lake region and over portions of the Middle Atlantic States the rainfall exceeded the average, a marked excess occurring over the northern portions of the upper lake region. Week generally favorable for farm work, but cool nights unfavorable for some crops. Cotton showed a general improvement. Corn planting well advanced. Promising conditions continued for winter wheat and spring wheat showed good progress.

Special Telegraphic Reports.

[Weather Bureau, Boston.]

Week ending May 10. — New England. Boston: Everything well advanced, notwithstanding cool weather; potato planting well under way; some corn planted in south portion; rye heading out; early vegetables making remarkable growth; fruit trees blossoming heavily.

Week ending May 17. — New England. Boston: Fine growing weather, although excessive rains have hindered planting; low grounds flooded; grass making rapid growth; corn being extensively planted; tobacco plants set in Connecticut; cranberry vines looking remarkably well; fruit prospects good, except apples.

Week ending May 24. — New England. Boston: Generally favorable week; warm, sunny days, but nights rather too cool; very light precipitation in many localities; crops making satisfactory growth; planting about finished in south and progressing well in north.

Weather for May, 1897.

May was characterized by somewhat variable weather conditions, not entirely favorable to the farmer, but, notwithstanding, the season is regarded as earlier than the average. The temperature ranged below the normal during the first eight days averaging a deficiency of about 2.5° each day. During this period the nights were altogether too cold for rapid or even steady growth. It was very cool on the morning of the 8th. In western Massachusetts ice formed and the ground froze in low lands, but a high wind protected fruit. The temperature returned to a more normal state with the beginning of the second decade, and by the 20th the accumulated excess was more than 40°. Farm work was nearly at a standstill from the 10th to 17th, owing to the prevalence of general heavy rains. Copious rains fell on the 12th and 13th, amounting in central sections to about two inches at the several reporting stations. The temporary delay in planting caused by the wet weather was more than compensated for by the immense good done to all vegetation. Grass, especially, pushed forward wonderfully fast, and the prospects for this crop are of the best. The week ending the 24th was cool and very dry, with considerable high wind. In the central and western portions of the State the rainfall was little more than a trace. There was an abundance of sunshine, but the cool nights checked growth. Frosts on the 22d and 23d produced no great damage so far as learned.

The chief features of the weather by decades during the month were as follows: 1st decade, temperature considerably

below normal; frequent frosts; precipitation above normal in eastern portion and about normal elsewhere; 2d decade, temperature above normal, but without excessive heat; precipitation greatly in excess, except on the immediate coast; 3d decade, temperature and precipitation about normal; heavy thunder showers during night of 24th and 25th.

In the circular to correspondents returnable May 23, the following questions were asked: —

1. How does the present season compare, agriculturally speaking, with a normal season?
2. What is the promise for pastures and mowings, and did fall seeding winter well?
3. How did the fruit bloom compare with the bloom of former years?
4. What insects appear to be doing the most damage in your locality?
5. To what extent is spraying practised against insects attacking fruit, and is it on the increase in your locality?
6. Is farm help scarce, or plenty; and what proportion would you call good help?
7. What wages, with board and without board, are paid farm help in your vicinity?
8. Will there be any marked change in the acreage of the usual farm crops, and do you note any new enterprises in the line of agriculture?

Returns have been received from 191 correspondents, and from them the following summary has been made up: —

The Season.

Replies tend to show that the season opened from one to two weeks earlier than usual, but the cold and wet weather of the month, while having an excellent effect on vegetation, still tended to reduce the progress of the season more nearly to the normal. On the whole, the season seems to be relatively earlier in western sections than in those nearer to the coast. In other respects the season is rather above the normal for this time of year. All crops are well advanced and making a good growth.

Pastures and Mowings.

Not for several years have the early reports in regard to pastures and mowings been so favorable. The copious rains of the past month have given both a good start and grass is everywhere thick and strong. Fall seeding generally wintered well and the spring rains have aided it in securing a good start. The promise now is for a full hay crop and abundant feed in pastures.

The Fruit Bloom.

Apples made a remarkably full bloom, considering the heavy crop of last year, although not up to that of a regular bearing year. Early varieties bloomed more fully than did winter ones. Pears, plums, cherries and quinces made a full average bloom. The peach bloom can hardly be called full, but is still much above the usual bloom for this section. Small fruits and wild berries generally blossomed well. The fruit bloom as a whole may be spoken of as average.

Insects.

Rather less damage than usual from insects has been reported. Tent caterpillars are the most common, but appear to be doing rather less damage than usual. But little serious damage from canker worms as yet. Currant worms and cut worms are present in about the usual numbers. Other insects mentioned are potato beetles, wire worms, horn flies, asparagus beetles, white grubs, squash bugs, and cabbage maggots. A new imported insect pest reported is the brown-tailed moth (*Euproctis chrysorrhœa*) which is doing much damage in portions of Somerville and Cambridge. A space of two square miles is known to be infested by the insect. It is there present in great numbers and unless prompt measures are taken to check its ravages it promises to become an extremely serious pest.

Spraying.

Spraying is not practised to anything like the extent which it should be, except by those who make fruit growing a specialty. This is doubtless due in many cases to a mis-

taken idea as to the cost of the work. If proper care is exercised, even a small number of trees may be sprayed at a trifling cost per tree, and the benefits will be found to more than compensate for the trouble and expense. Readers are referred to our Crop Report for May, 1896, page 12, for a few practical hints on the practice of spraying. More spraying is done each year, and the increase, while slow, is nevertheless constant from year to year.

Farm Help and Wages.

Farm help is plenty in most localities, though considerable complaint is made that really good help is difficult to secure. There seems to be more good help to be had than formerly, due doubtless to the number of foreigners who have come into the State during past years, and who may now be rated as experienced and competent farm hands. Wages average about $17 or $18 per month with board and from $12 to $15 more per month without board. For day help the range reported is from $1.00 to $2.00 per day. The usual price paid in most localities, except in haying and harvesting time, is $1.25.

Acreage of Farm Crops.

Most correspondents report that there are no marked changes in the acreage of farm crops. Rather more corn than usual is being planted, the increase being mostly for the silo. In the Connecticut valley the acreage of tobacco and onions will probably be slightly increased. A slight increase in the culture of asparagus is noted. Very few new enterprises in agriculture are mentioned, and these relate mostly to increased attention to poultry and also to small fruits, especially strawberries.

NOTES OF CORRESPONDENTS.

(Returned to us May 25.)

BERKSHIRE COUNTY.

Egremont (J. H. Rowley). — The season is about ten days earlier than last year. Pastures and mowings promise well and fall seeding wintered well. The fruit bloom is about average. No damage from insects worth mentioning. Not much spraying is done, but it is on the increase. Farm help is scarce and about half is good help. Wages are the same as last year. There is no material change in the acreage of farm crops and no new enterprises.

Otis (S. H. Norton). — The season is about an average one, agriculturally speaking. Pastures and mowings are looking well. Pears bloomed very full, but apples did not make an average bloom. Spraying against insects is not practised. Farm help is scarce. There is no change in the acreage of the usual farm crops and no new enterprises.

Lee (A. Bradley). — The present season is 5 per cent above the normal. Pastures and mowings never were better and fall seeding wintered well. There was a full fruit bloom. Two fruit growers in this town spray their trees. Farm help is very plenty and one in six is good help. Wages are $20 per month with board and $36 without for good help. The acreage of potatoes is less than usual. Poultry raising is on the increase.

Richmond (T. B. Salmon). — The present season is above the average, agriculturally speaking. Pastures and mowings promise excellently and fall seeding wintered well in most cases. The fruit bloom was the largest I have ever seen. Tent caterpillars are doing the most damage of any insect. About 10 per cent of our fruit growers practice spraying and it is on the increase. Farm help is plenty and about half is good help. Wages are from $8 to $18 per month with board and $1.25 to $1.60 per day without board. There has been no marked change in the acreage of farm crops and no new enterprises. The month has been cool, with plenty of rain.

Cheshire (L. J. Northup). — The present season is very much in advance of former seasons. Pastures and mowing lands promise well. The fruit bloom was extra good in all varieties. Tent caterpillars are very numerous. Spraying is not practised. Farm help seems to be quite plenty and is good in our neighborhood. Wages are from $15 to $18 per month with board. I think corn is being raised more extensively than in former years.

Williamstown (S. A. Hickox). — The present season compares well with former ones. Pastures and mowing promise well and fall seeding wintered well. All fruit trees had a full bloom. Tent caterpillars are doing some damage. Spraying is practised to a slight extent and is on the increase. Farm help is plenty and one-fourth of it is good help. Wages are $15 to $20 per month with board and $30 to $35 without board. Strawberry culture is a new enterprise which is being established in this vicinity.

Florida (E. D. Rice). — The season is two weeks earlier than the normal. The promise for pastures and mowings is very encouraging. Every fruit tree is in full bloom. Tent caterpillars are doing some damage. Spraying not practised. Farm help is scarce and one-tenth of it is good help. Wages are $18 per month with board and $1.25 to $1.50 per day without board. A good many farmers are using separators in their dairy practice.

FRANKLIN COUNTY.

Charlemont (H. S. Giles). — The season is above the normal and good crops are promised. Pastures and mowings promise well and fall seeding wintered well. Pears made a full bloom and apples about an average one. Tent caterpillars are plenty. Spraying is not practised in this locality. Farm help is plenty and nearly all of it good. Wages are $15 to $20 per month with board and $1.00 to $1.25 per day without board. A full average acreage of farm crops will be grown, with an increase of corn for the silo.

Colrain (A. A. Smith). — The season is 50 per cent above the normal in every respect. Grass is looking well and fall seeding wintered well. The fruit bloom was less than an average. Tent caterpillars are doing some damage. Spraying is very little practised, but is on the increase. Farm help is scarce and half of it is poor. Wages are $20 per month with board and $1.25 per day without board. There is no marked change in the acreage of the usual farm crops and no new agricultural enterprises.

Conway (J. C. Newhall). — The present season is rather above the average one. Pastures and mowings look finely and fall seed-

ing wintered first rate. The fruit bloom is not up to the average of former years. Tent caterpillars are very plenty. Not much spraying is done in this town. Farm help is rather scarce, but what there is is pretty good. Wages are $18 to $20 per month with board and $28 to $30 without board. There is very little change in acreage of farm crops; there may be a little more tobacco put out and perhaps dairying is on the increase.

Gill (F. F. Stoughton). — The present season is a favorable one. Pastures and mowings are in very good condition. The fruit bloom is not very heavy and many choice apple trees did not blossom. Spraying is practised to a small extent. There is not much change in the acreage of farm crops and no new agricultural enterprises.

Wendell (N. D. Plumb). — Pastures and mowings never looked better and fall seeding wintered well. Spring seeding is completed. The fruit bloom compares favorably with former years. No insects are doing damage. Spraying is not practised here. Farm help is scarce and about half is good help. Wages are $1 per day with board and $1.50 without. There is a slight increase in the acreage of potatoes, but no new agricultural enterprises.

Sunderland (J. M. J. Legate). — I should say the season is about a week earlier than common. Pastures and mowings are looking well and fall seeding wintered well. Apples, pears and plums made a very heavy bloom and peaches a light one. Insects are not doing much damage yet. No spraying is done here. Farm help is very plenty and mostly good. Wages are from $12 to $18 per month with board and from $1 to $1.50 per day without board. There is a much increased acreage of onions, a slight increase in tobacco and perhaps a little more corn planted for the silo. Onions are looking finely and tobacco beds are good.

New Salem (Daniel Ballard). — The present season is above the average. Pastures and mowings are very promising and fall seeding wintered well. There is a full fruit bloom of most fruits, apples not excepted. Tent caterpillars are doing some damage. Many are talking of spraying, but only a few practise it. Help is rather scarce and perhaps half is good help. Wages are $8 to $16 per month with board and $1.25 to $1.50 per day without. No marked changes in the acreage of farm crops.

HAMPSHIRE COUNTY.

Prescott (W. F. Wendermuth). — The present season is about an average one. Pastures and mowings promise well and fall seeding wintered fairly well. The fruit bloom was better than on

most off years. Tent caterpillars are very plenty. Spraying is not practised. Farm help is scarce, but is nearly all good native help. Wages are $20 to $25 per month with board and $1.25 per day without board. The acreage of farm crops is about as usual, with perhaps more forage crops.

Ware (J. H. Fletcher). — The present season compares well with the normal. The promise for pastures and mowings is above the average and fall seeding wintered well. The fruit bloom is not as full as last year. Tent caterpillars are doing some damage. Spraying is not practised, to my knowledge. Farm help is plenty. Wages are $12 to $15 per month with board and $1.50 per day without board. About the usual acreage of the various farm crops has been put in this year.

Belchertown (H. C. West). — The season compares favorably with the normal. Pastures and mowings promise finely and fall seeding wintered well as a general thing. The fruit bloom is not quite equal to last year, but is still very fair. Tent caterpillars are abundant. Spraying is not yet practised very extensively, but has got to come. Farm help is scarce and not more than one in five is either competent or reliable. Wages are $15 to $20 per month with board and from $1.25 to $1.50 per day without board. Less corn and more potatoes and forage crops have been put in than is usual. Cool weather with abundant rains has given grass an excellent start.

Hadley (H. C. Russell). — The season is late, there having been no hot days. Pastures are not forward, fall seeding looks fair. Apples blossomed very full, also small fruits. Currant worms and tent caterpillars are doing some damage. Spraying is not much practised. Farm help is rather plenty and three-fourths is good. Wages are $15 to $18 per month with board and $1.25 to $1.50 per day without. There is a slight increase in tobacco and a larger acreage of onions.

Williamsburg (F. C. Richards). — The season is quite favorable as a whole and in some respects much above the normal. Apples made about half a bloom, pears medium, cherries, peaches and quinces fully 100 per cent. The tent caterpillar is claiming our attention at present. Spraying is practised somewhat, but does not increase. Farm help is plenty, but not more than one-fourth can be called good. Wages are from $10 to $20 per month with board. There is a slight increase in the acreage of tobacco and a corresponding decrease in that of corn and potatoes.

Cummington (S. W. Clark). — The season is two weeks earlier than usual. Pastures and mowings promise very well, but fall seeding winter-killed to some extent. The fruit bloom is normal

and not as heavy as last year. Tent caterpillars are doing some damage. Spraying was commenced last year and I presume more will be done in the future. There is a fair supply of farm help, mostly Polanders, who are good help, barring their ignorance of the English language. Wages are $15 per month with board and $1.00 per day without board. No change in the acreage of the usual farm crops.

Huntington (H. W. Stickney). — Vegetation is a week or ten days ahead of the normal season. Pastures and mowings promise finely, seldom if ever better. The fruit bloom is not quite as full as usual. Wire worms are doing some damage and horn flies trouble the young stock in pasture. No spraying to any amount done here. Good farm help is scarce and about one-third of the supply is good. Wages are from $12 to $18 per month with board. I should judge more potatoes than usual are planted.

HAMPDEN COUNTY.

Chester (P. M. Adzima). — The present season is, agriculturally speaking, the best on record. Grass and feed in pastures are looking finely. The fruit bloom is about average. No insects are doing damage as yet. Farm help is plenty and one-tenth is good help. Wages are about the same as in former years. No marked change in the acreage of farm crops. Corn planting is now going on and some potatoes are already up.

Tolland (E. M. Moore). — The season is fully a week earlier than usual. Mowings and pastures are looking finely and fall seeding wintered fairly well. Apple and pear trees are in full bloom. Spraying is not practised to any extent. Farm help is scarce, especially good help. Wages are 75 cents per day with board and $1.25 per day without board. About the usual acreage of farm crops will be planted.

Russell (E. D. Parks). — The season is very favorable and rather more advanced than the average. Mowings and pastures look strong and thick and have a good start. The fruit bloom was about the same as usual. Tent caterpillars are doing some damage. Spraying is but little practised and is not increasing. There is plenty of good help in this vicinity. Wages are $15 to $20 per month with board and $1.50 per day without board. There are no marked changes in the acreage of farm crops and no new agricultural enterprises.

West Springfield (J. N. Bagg). — The present season compares very favorably with the normal. Pastures and mowings promise well. The fruit bloom was a full average. Currant worms and

tent caterpillars are doing some damage. Farm help is plenty and one-fourth is good help. Wages are $1.00 per day without board and 75 cents with. There is no marked change in the acreage of the usual farm crops.

Longmeadow (W. F. Emerson). — The season is about an average one. Pastures and mowings promise better than for several years past and fall seeding wintered well. The fruit bloom is fully up to the normal and no effect of the April freeze can be seen. There are more tent caterpillars than for a year or two. Spraying is not practised. Good help is not plenty. Wages are $20 per month with board and $1.50 per day without board. There is nothing new in agricultural enterprises.

Monson (A. H. White). — The season is fully as early as the average. Pastures and mowings are looking well at present. Apples made a light bloom and peaches and plums a heavy one. Tent caterpillars are doing some damage. Spraying is but little practised. Farm help is scarce and farmers are not hiring as much as usual. Wages are from $15 to $20 per month with board and $1.25 per day without board. Rather more corn and potatoes will be planted than in 1896.

Palmer (O. P. Allen). — The present season is fully up to the average. Pastures and mowings promise well and fall seeding wintered fairly well. The fruit bloom was very good. Moles are more troublesome at the present writing than are insects. Good help is scarce. Wages are about $1.50 per day without board.

Brimfield (G. M. Hitchcock). — The early season was very dry, but abundant rains have fallen of late. Grass started early, but there is general complaint that fall seeding did not winter well. The fruit bloom is lighter than last year, for which we are thankful. Canker worms have made their appearance. Spraying is not practised at all. Farm help is scarce. Wages $16 to $20 per month with board and $1.50 per day without board. Less corn and potatoes will be planted this year than formerly.

WORCESTER COUNTY.

Sturbridge (C. V. Corey). — The season is good, but not as early as some years. Pastures and mowings are looking better than the average and fall seeding wintered well. The fruit bloom was not as good as last year, but a good average. Tent caterpillars are doing some damage. Not much spraying is done and it is not increasing. Farm help is not plenty and one-fourth is good help. Wages are $15 to $20 per month with board and $30

to $40 without board. There is no marked change in the acreage of the usual crops, but more attention is given to small fruit, especially strawberries.

Spencer (H. H. Kingsbury). — The season is very favorable; frost left the ground early. There promises to be a good yield in pastures and mowings. Apple bloom below the average, pear, peach and cherry fully up to the average. Tent caterpillars are doing some damage. There is no spraying done. The supply of farm help is about on the average for the past five years. Wages are from $12 to $20 per month with board. No changes in the farmer's programme for the coming season.

Dana (E. A. Albee). — The season is about a week earlier than the normal. Pastures and mowings promise well and fall seeding wintered well. The apple bloom was very light, pear, plum and peach bloom good. Tent caterpillars never were so numerous. Very little spraying is done. Farm help is plenty and two-thirds is good help. Wages $12 to $20 per month with board and $1.50 per day without. Acreage of crops about the same as usual and no new enterprises noted.

Hubbardston (C. C. Colby). — The present season compares well with the normal. Grass is very heavy and forward for the season and fall seeding wintered well. The fruit bloom is about average. Tent caterpillars are very plenty. There is very little spraying done. There is plenty of help, but good help is very scarce. Wages are $16 to $20 per month with board. The usual acreage of farm crops has been put in. Early-sown oats are looking well and promise a good crop.

Templeton (Lucien Gove). — The season is about an average one. Mowings are in better condition than for several years; no material change in pastures; fall seeding generally wintered well. A full fruit bloom with pears, peaches, plums, cherries and small fruits; Baldwin apples light, other kinds good. Tent caterpillars are more than usually abundant. Very little spraying is done. Farm help is more plentiful than for years; one-fifth passable help. Wages from $10 to $20 per month with board and from $1.00 to $1.50 per day without. Rather less potatoes than usual, but more corn and forage crops.

Royalston (C. A. Stimson). — There has been more rain than usual. Pastures and mowings are looking better than for years. The fruit bloom is less than normal. Tent caterpillars are doing some damage. No spraying is done. Good help is always scarce; many employ Poles. Wages are $1.50 per day without board and $8 to $18 per month with board. More ensilage corn will be put in than usual.

Fitchburg (Jabez Fisher). — The season is eight days earlier than the average for forty-one years, as determined by the date of apple blossom. Pastures and mowings are unusually promising and everything wintered well. Cherries, pears, plums and some peaches bloomed very full; apples light, though some trees are prolific of bloom. Tent caterpillars are doing some damage. Spraying is not much practised and is not on the increase. Farm help is fairly plenty, with only a small per cent first class. Wages are $16 to $20 per month with board and $1.50 per day without. Few changes in acreage will be made.

Harvard (J. S. Preston). — The season seems very favorable. Pastures and mowings promise well and fall seeding wintered well. Early apples bloom fair, Baldwins very light, peaches, plums and pears heavy. Tent caterpillars are quite plenty. Spraying is not much practised, but is on the increase. Farm help is plenty and about four-fifths good. Wages are $20 per month with board and $1.50 per day without. There is no marked change in the acreage of farm crops, but peaches and asparagus are on the increase.

Northborough (J. K. Mills). — The season promises to be a good one. Pastures and mowings promise well and fall seeding wintered well. Small fruits make a good bloom and apples half a bloom. Canker worms, tent caterpillars and currant worms are doing some damage. About half our people spray, but the practice is not increasing. Farm help is plenty, but there is little good help. Wages are $16 to $20 per month with board and $1.25 to $2 per day without. There is no marked change in the acreage of farm crops and no new enterprises in agriculture.

Worcester (S. A. Burgess). — The present season compares favorably with the average. Pastures and mowings promise finely and fall seeding wintered well. Pears and small fruits had more than an average bloom and apples were above the average of odd years. Canker worms and tent caterpillars are doing some damage. Spraying is not much practised and is not increasing. Farm help is plenty and about two-thirds of it is good help. Wages are about $24 per month with board and $1.50 per day without. There are no marked changes in the acreage of farm crops.

Sutton (O. P. Johnson). — The season is fully up to the normal. Pastures and mowings promise splendidly and fall seeding wintered fairly well. The fruit bloom is about the same as in former off years. No insects are doing damage as yet. Spraying is hardly practised and is not increasing. Farm help is neither scarce nor plenty. Wages are from $17 to $25 per month with board and from $25 to $33 without. No changes in acreage of usual farm crops.

Blackstone (L. R. Daniels). — The season is good, cool without extremes, and plenty of rain. Pastures and mowings promise well and fall seeding shows finely. Bloom light on Baldwins, other fruit trees about as usual. Tent caterpillars have made the most trouble. Perhaps one-fourth of the fruit trees get sprayed and it is increasing. There is no regular farm help and no good help. Wages are about $20 per month with board and $1.25 per day without. More potatoes than usual have been planted.

MIDDLESEX COUNTY.

Townsend (Geo. A. Wilder). — The season is more advanced than usual. Pastures and mowings are above the normal and fall seeding wintered well. The fruit bloom is heavier for an off year than previously for some years. Tent caterpillars are doing some damage. Spraying is very little practised, but is increasing. Farm help is plenty and 60 per cent is good help. Wages are about $20 per month with board and $35 without. There is no marked change in the acreage of farm crops, but peaches and small fruits are on the increase.

Dunstable (A. J. Gilson). — The season is fully up to the normal. Pastures and mowings look well and fall seeding generally wintered well. The apple bloom was small, but other fruit trees blossomed well. Tent caterpillars are doing some damage. Very little spraying is done and it is not increasing. The supply of farm help is about equal to the demand and is good as a whole. Wages are about $20 per month with board and $1.25 to $1.50 per day without. There is no change to note in the acreage of farm crops.

Billerica (J. N. Pardee). — The season is favorable, though somewhat late. Pastures and mowings were never better. Everything but apples bloomed about an average; peaches are especially promising. Tent caterpillars and currant worms are doing some damage. Spraying is quite generally practised and is on the increase. Fewer men are hired than formerly and farmers are getting their pick of the best men. Wages are from $10 to $22 per month with board. The acreage of hoed crops is probably less than usual. No new enterprises.

Woburn (W. H. Bartlett). — The season is about a week late and the ground is wet and cold. Pastures and mowings promise well, but some fall seeding winter-killed. Summer and fall apples had a full bloom, winter ones light, pears and peaches very full, currants never better. Tent caterpillars and currant worms are doing some damage. The practice of spraying is on

the increase. Help plenty, but good help scarce. Wages are $1.50 per day without board. The full acreage of farm crops has been planted.

Arlington (W. W. Rawson). — The season compares very favorably with the normal. The fruit bloom was very light. No insects are doing damage. The practice of spraying against insects is on the increase. Farm help is plenty and is mostly good help. Wages are about $20 per month with board. The acreage of the usual farm crops is about the same as in former years.

Lincoln (Samuel Hartwell). — The season looks favorable at present. Pastures and mowings are looking unusually well and fall seeding wintered well. Full bloom on peaches, pears and early apples; few winter apples. Canker worms are doing some damage. Spraying is but little practised, but is increasing. Farm help is mostly good. Wages are about $20 per month with board and $35 without. Farmers raise about the same crops in kind and amount each year.

Stow (G. W. Bradley). — The season is about an average one. Pastures and mowings promise well and fall seeding wintered well. The fruit bloom was very good, considering the large crop of last year. Very few insects as yet. The majority of our farmers spray. Help seems to be plenty and averages very good. Wages are from $12 to $25 per month with board and from $1.25 to $2 per day without. The acreage of farm crops is about as usual. A few farmers are going into asparagus.

Weston (H. L. Brown). — The season is a week or ten days earlier than usual. Pastures and mowings promise well and fall seeding mostly wintered well. A fair bloom on fall apples, pears very full, peaches and cherries good. Insects are not doing much damage. Our people spray for the canker worm mostly and there are few as yet. Farm help is plenty, but less than half of it is good. Wages are $16 to $20 per month with board and $1.50 to $1.75 per day without. No marked change in the acreage of farm crops.

Sherborn (N. B. Douglas). — The season is fully up to the normal. Mowings and pastures look well and fall seeding wintered well. The bloom on all kinds of fruit was heavy, except on Baldwin apples. Canker worms are doing some damage. Spraying is well-nigh universal. Farm help is fairly plenty and 60 per cent is good. Wages are $16 to $22 per month with board and $1.50 per day without. No appreciable difference in the acreage of farm crops and no new enterprises.

ESSEX COUNTY.

Amesbury (F. W. Sargent). — The season is rather better than the normal, cool and with plenty of rain. Pastures and mowings promise considerably better than last year and fall seeding wintered well. Fall apples made a good bloom, pears abundant, peaches plenty. Tent caterpillars and white grubs are doing some damage. Spraying is the popular method of fighting insects and is gradually increasing. Farm help is not plenty and less than ten per cent is good help. Wages are $16 to $20 per month with board and $1.50 per day without. The acreage of potatoes, cabbage and onions is increased possibly 5 per cent.

Groveland (Abel Stickney). — The present season compares well with any season. Pastures and mowings promise well and fall seeding wintered well. Apples had a light bloom, other fruits above average. Tent caterpillars are doing some damage. Spraying is not practised to any great extent, but is on the increase. Farm help is scarce and not over half is good. Wages are $15 to $20 per month with board and $1.00 to $1.50 per day without. The acreage of farm crops is increased as a whole.

Andover (M. H. Gould). — The season is a little late. Pastures and mowings promise very well and fall seeding wintered well. Pears bloomed well, as did apples for an odd year. Tent caterpillars are doing some damage. Spraying is not practised. Help is plenty and one out of six is good. Wages are $15 to $20 per month with board and $30 to $40 without. The acreage of farm crops is about the same as usual.

Topsfield (B. P. Pike). — The present season is about an average one. Pastures are good and fall seeding very fair. Pears, peaches and plums bloomed very full; apples 25 per cent. Spraying is on the increase; generally used against the canker worm. Help is not very plenty and ten per cent is good help. Wages are $16 to $22 per month with board and $1.50 per day without. No marked change in the acreage of farm crops.

Ipswich (O. C. Smith). — The season is earlier than usual, with more rain. Pastures and mowings are in good shape and fall seeding is generally good. Cherries and pears made a good average bloom, while apples made about twenty per cent. Tent caterpillars and cut worms are doing some damage. Most farmers spray for canker worms and the practice is increasing. Help about fills the demand and about 40 per cent is first class. Wages are $18 to $28 per month with board and $1.25 to $1.50 per day without. Farm crops will be about the same as last year.

Manchester (John Baker). — The season is a little in advance of the normal. Pastures and mowings promise well and fall seeding wintered well. Apples had a light bloom and pears and peaches a good one. Tent caterpillars and canker worms are doing some damage. Spraying is little practised, but is on the increase. Help is plenty and half is good help. Wages are $20 to $25 per month with board and $1.75 to $2.00 per day without. Not much change in the acreage of the usual farm crops.

NORFOLK COUNTY.

Dedham (A. W. Cheever). — The season is fully up to the average. Pastures and mowings show a promising outlook and fall seeding wintered well. Pears and plums made a full bloom; apples light, with scattering trees in full bloom. Canker worms and cut worms are doing some damage. Spraying is practised to a very limited extent. Good farm help is never plenty. Wages are about $2 per day without board. No marked changes in the acreage of the usual farm crops.

Norwood (F. A. Fales). — The season is ten days late. Pastures are good and mowings never better; one-third of the fall seeding poor. The fruit bloom is about half that of 1896. Currant worms are doing some damage. Spraying is very little practised and is not increasing. Wages are $18 to $20 per month with board and $1.75 per day without. No changes in the acreage of farm crops.

Canton (B. R. Doody). — The present season is a fair one. Pastures and mowings promise well and fall seeding wintered well. The fruit bloom compares very well with that of former years. Cut worms and potato bugs are doing some damage. Spraying is very little practised and is not increasing. Farm help is plenty, but most of it is poor. There are no changes in the acreage of farm crops and no new agricultural enterprises.

Norfolk (G. E. Holbrook). — The season seems to be about seven days earlier than usual. Pastures and mowings promise well and fall seeding looks well. Apples made a better bloom than was expected and pears and small fruits a full bloom. Very little if any spraying is done. Farm help is scarce and about half of it is no good. Wages are from $16 to $20 per month with board and $30 to $40 without. Farmers seem to be on a still hunt for some money crop to raise, but cannot seem to find it.

Foxborough (H. H. Fenton). — The season has been cold so far, with more than the usual amount of rain. Grass looks well everywhere; perhaps 20 per cent of the fall seeding wintered

well. Small fruits, plums, cherries and pears bloomed fuller than for years, apples about half. Tent caterpillars and cut worms are doing some damage. Spraying is practised but slightly but is possibly increasing. Help is somewhat scarce and very little could be called good. Wages are $18 per month with board and $1.50 per day without. Not as many potatoes and more corn than usual will be raised. Should judge that more attention is being paid to poultry.

BRISTOL COUNTY.

Attleborough (Isaac Alger). — The season is about normal. Pastures and mowings are now promising and it is a long time since I have seen them look so well. Apples made a small bloom, pears full, and the early varieties of strawberries are making a great show of bloom. Spraying is not practised to any great extent. Farm help is scarce and about 25 per cent is good. Wages are $16 to $20 per month with board and $30 to $40 without. There are no marked changes in the acreage of farm crops.

Raynham (N. W. Shaw). — The present season is fully up to the average. Pastures are good and mowings look well; fall seeding above an average. The fruit bloom is much larger than usual for an odd year. Currant worms are doing some damage. Spraying is practised to a small degree, but is on the increase.

Help is plenty, but only a small proportion is good. The acreage of farm crops will be smaller than usual. No new agricultural enterprises.

Dighton (J. N. Paul). — The present season compares very favorably with the normal. Pastures and mowings promise well and fall seeding wintered well. The fruit bloom is not as good as usual, very few apples, pears or peaches. Cut worms are doing some damage. Spraying is practised somewhat and is increasing. Farm help is plenty, but very little of it is good. Wages are $10 to $20 per month with board and $1.00 to $1.50 per day without. More strawberries are being set this year than usual. The plants wintered well and the fields are looking extra good.

Dartmouth (L. T. Davis). — The season is a little cooler than the normal. Pastures and mowings promise well and fall seeding wintered well. Apples made a scant bloom, plums very full, peaches fair and small fruits good. Spraying is not practised at all to speak of. There is about the usual quantity and quality of help. Wages are from $15 to $20 per month with board and $1.25 to $1.50 per day without. There is no marked change in the acreage of the usual farm crops.

Fairhaven (F. C. Lyon). — The season has been very wet and some have been delayed in planting until the middle of the month. Pastures are excellent and a large hay crop is indicated; fall seeding wintered well. There was a very large fruit bloom, better than last year. Insects have not appeared to any extent. Spraying is on the increase. Farmers can get all the help they need and it is all good. Wages are from $8 to $20 per month with board and $1.50 per day without. Acreage of farm crops about as in the past.

PLYMOUTH COUNTY.

West Bridgewater (F. E. Howard). — The present season is fully up to the average. Pastures and mowings promise well and fall seeding wintered well. The fruit bloom is not as full as usual. Canker worms are doing some damage. Spraying is practised to a limited extent and is increasing. Help is plenty and half of it is good. Wages are $20 per month with board and $1.50 per day without. No change in acreage of farm crops and no new enterprises.

Hanson (F. S. Thomas). — The present season is rather backward. Pastures and mowings promise well and fall seeding wintered well. Peaches and pears made a full bloom, russet apples full, few Baldwins or greenings. Spraying is not much practised, but is on the increase. Help is mostly hired by the day and the supply equals the demand. Wages are from $1.50 to $2.50 per day without board. No change in the acreage of farm crops.

Marshfield (J. H. Bourne). — The season is nearly an average; asparagus and rhubarb a little earlier than last year. Grass promises excellently and fall seeding looks well. Less than the usual fruit bloom, but pear trees full. Tent caterpillers are doing some damage. Spraying is not much practised and is not increasing. Help is plenty and one in four is good. Wages are $15 to $20 per month with board and $1.50 per day without. Somewhat less potatoes planted than usual. One or two propose to raise muskmelons.

Kingston (J. H. Cushman). — The season is about a normal one. Pastures and mowings are looking well and fall seeding is looking finely. The apple bloom was below the average, but pears were fully up. Cut worms are doing some damage. There is no spraying done. Good help is scarce, not more than one in seven being good. The average wage is about $25 per month. Full average acreage of all crops and nothing new in the line of agriculture.

Lakeville (Elbridge Cushman). — The season is a very good one. Mowings promise well and pastures have not been better at

this time for years. Pears and peaches made an abundant bloom, but apples were not as good as last year. Canker worms have just commenced to work. Spraying is on the increase, but is not yet regularly practised. Farm help is plenty and one in five is good. Wages are $15 per month with board and $1.25 to $1.50 per day without. There is much less fertilizer used than in former years and some reduction of acreage in most of the farm crops.

Carver (J. A. Vaughan). — The present season compares well with the normal. All grass is looking finely. All kinds of fruit blossomed well. But few insects have appeared as yet. Spraying is not practised. Farm help is plenty and perhaps half is good. Wages are from $8 to $20 per month with board and from $1.25 to $1.50 per day of nine hours without. There is not as much planting as usual.

BARNSTABLE COUNTY.

Bourne (D. D. Nye). — The season is better than the average. Pastures and mowings promise excellently and fall seeding wintered well. The fruit bloom is first rate. Tent caterpillars are doing some damage. Spraying is not at all practised. Farm help is scarce and 80 per cent is good. Wages are $16 per month with board and $2 per day of nine hours without. The acreage of farm crops is reduced one-half; no new enterprises except in a small way with small fruits. Wild berries set well.

Falmouth (D. R. Wicks). — The season is a little backward. Pastures and mowings are looking finely where not eaten by white grubs last year. Peach, pear and cherry trees bloomed very full; apples have not bloomed yet, but promise to be full. No spraying done, but should be. Help is not plenty; about one-half is fair help and one-fourth good. Wages are $1.50 per day with board and $2 without.

Barnstable (John Bursley). — The season is a little more forward than last year. Pastures and mowings are light, but fall seeding wintered fairly well. The fruit bloom is greater than that of 1896, but no greater than the year before. Tent caterpillars are doing some damage. Spraying is very little practised. Farm help is plenty and one-fourth is good. Wages are $20 per month with board and $1.50 per day without. No change in the acreage of farm crops and no new enterprises.

Brewster (J. H. Clark). — The season is about an average one. Pastures and mowings promise very well and fall seeding wintered well. There was about an average fruit bloom. Tent caterpillars are doing some damage. Spraying is practised to a

small extent, but is not increasing. Farm help is plenty and three-fourths of it is good. Wages are $1.50 per day without board and $25 per month with board. There is a slight increase in the acreage of asparagus. No new enterprises.

Harwich (A. N. Doane). — The season is a favorable one. Pastures are in good condition and fall seeding first class. The fruit bloom was not as good as last year. Tent caterpillars are doing some damage. Not much spraying is done. There is a fair supply of help, three-fourths of which is good. Wages are about $20 per month with board. There is an increase in the culture of asparagus and small fruits.

Eastham (J. A. Clark). — The season is about normal. The promise for pastures and mowings is good. Pears made a full bloom, early apples full, no Baldwins. No insects of any amount as yet. Spraying is on the increase. There is enough farm help to supply the demand. Wages are $12 to $20 per month with board and $1.50 to $1.75 per day without. Acreage of farm crops about as usual. Prices for asparagus good so far. Heavy winds have damaged the crop on light lands, but there has been less damage from beetles than usual.

DUKES COUNTY.

West Tisbury (Geo. Hunt Luce). — The season is much more favorable than usual. Mowings and pastures promise better than the average. The fruit bloom is as good or better than the normal. Tent caterpillars are doing a little damage. There has been some spraying of late. Supply of help about equal to the demand and one in ten good help. Wages are $1.50 per day without board and from $10 to $25 per month with board. About the usual acreage of farm crops.

NANTUCKET COUNTY.

Nantucket (C. W. Gardner). — Vegetation is nearly two weeks earlier than usual. Pastures are fine and grass promises well. Strawberries have bloomed and set finely. White grubs are doing some damage to the strawberries. Spraying is not practised. Farm help is very scarce and there is very little good help. Wages are from $10 to $25 per month with board. There is more land than usual put down to hoed crops and there are a good many acres more than common seeded to oats and pease.

BULLETIN OF
MASSACHUSETTS BOARD OF AGRICULTURE.

SMALL FRUITS IN THE HOME GARDEN.

By S. T. Maynard, *Botanist and Pomologist to the Board.*

Small fruits are pre-eminently the fruit for the home garden. They are easily grown, and do not require a large amount of land to produce a liberal supply of fruit for home consumption. The fruit can be put on the consumer's table in a fresh, ripe condition, quite unlike the fruit purchased from the market.

The increasing interest in fruit in the home garden and the numerous inquiries as to the best methods, fertilizers and varieties, have led to the preparation of this bulletin, in which the practice of the best growers is given briefly, modified so as to adapt it especially to the home garden.

The Strawberry.

The strawberry is perhaps the most important fruit in cultivation in the temperate zone, and especially as a home fruit, although it takes a leading place as a money crop for fruit growers in all sections of the country. In yield, measured in quarts or bushels, it will probably average through a series of years more than that of any other fruit crop. Reliable records have frequently been made of nearly one thousand bushels per acre, and with an average of from two hundred to three hundred bushels per acre under good average condition of cultivation, or one to two bushels per square rod. The strawberry possesses unusual importance, in that it is the first fruit to ripen in the summer, and is the one that gives the quickest returns to the grower after planting.

Conditions of Successful Growth.

The strawberry will succeed upon a variety of soils, but to reach the best results on a given soil, varieties must be selected that grow best on that soil. For most varieties, however, the best soil is a deep medium loam, made rich by the addition of stable manure ploughed deeply under, and the surface well dressed with fine-ground bone and potash, or fine stable manure. An unfavorable soil may often be greatly improved at a little expense. If too heavy and moist, underdraining or the addition of sand will improve its condition; while if too light and dry, ploughing or spading under a heavy coating of stable manure or other organic matter will enable it to retain more moisture, without which a large crop cannot be produced. New land gives the best results, *i. e.*, that which has been in grass for many years; but it should not be planted with strawberries until some other hoed crop, like corn or potatoes, has been grown on the land one or two years, to avoid injury from the "white grub" or larvæ of the May beetle, which are generally found in such land and would continue feeding upon the roots of the strawberry when the grass roots have decayed.

Time for Planting.

The best time to set strawberry plants is as early in April as the land will work up fine and mellow. Never set plants in soil that will cake or dry into hard masses when pressed in the hand. Early in the season plants have but little foliage, the soil is moist and cool, evaporation is much less than when the foliage is large and the sun high, and plants are much more certain to grow than when set later. Summer and fall planting cannot be recommended when the best results are desired. If one has neglected to plant in the spring, it may be better to plant late than not at all, but little or no profit can be expected.

Setting the Plants.

Many persons fail to make strawberry plants grow, from setting them too deep, others from too shallow planting, and more from not pressing the soil about the roots firmly enough. The following figures illustrate these conditions: Fig. 1, the *proper depth;* Fig. 2, too deep, and Fig. 3, too shallow planting. A test of the proper firmness of the soil may be made by taking hold of the leaf of the newly set plant, and if it is properly firmed the leaf will break off, leaving the plant in position, but if not the plant will be

drawn out of the soil. No fruit should be allowed to ripen on the newly set plants the first season.

Fig. 2.

Fig. 1.

Fig. 3.

Distance for Planting.

There is a great diversity among practical growers in the distance at which the plants are set, and also under different conditions. On a very rich soil the plants may be set further apart than on thin soil, and it may vary under these conditions from one by three feet to four by five feet, using from twenty-five hundred to seven thousand plants per acre. In the garden where the soil is not very rich and where the plants are grown more or less in the hill or wide-distance matted row, even less than the smaller number may be set.

Method of Training.

Two general methods of training are practised, the hill and matted row, both of which are varied by different commercial growers, and admit of greater variation in the garden than in the field. The close matted row is where the runners are allowed to grow over all the space except where the cultivator runs between the rows. The modified or wide-space matted row is where only a limited number of the runners are allowed to grow, each plant having from four to six inches space for development. By the hill system the plants, put out in the spring, are not allowed to set any runners. The advantage of the first method is that the plants serve to protect each other during the winter, and a very large crop is often produced; but the plants do not have a chance to fully develop, and the fruit will be of small size and inferior quality. In the modified or wide-space matted row each plant has space for perfect development, and the crop is large and of fine quailty. This method is especially adapted to the home garden. With the hill system, no runner being allowed to grow,

a large number of crown buds are formed and a large number of flower buds produced, but the plants are liable to become shallow-rooted and easily thrown out by the frost. If the plants are in hills heavily mulched during the winter and during the fruiting time, fairly good results will be obtained, but not equal to that from the modified matted row.

Cultivation and Fertilization.

In fitting the land for the strawberry, the deeper it is worked, provided the subsoil is not brought to the surface, the better. Frequent stirring of the soil during the summer must be followed if the best growth is desired.

Fertilizers containing a large per cent of potash and phosphoric acid should be used for the production of fruit. Nitrogenous manures should be used sparingly, unless the soil is very poor, as they tend to the production of foliage at the expense of the fruit. A very good formula is from twelve hundred to two thousand pounds of fine-ground bone and five hundred pounds of potash per acre. Use one-half at planting, sown broadcast, one-quarter early in August and the balance early in April of the following year. If stable manure is used for a surface dressing in the spring, it should be well rotted and fine.

Winter Protection.

There are scarcely any conditions under which the strawberry crop is not improved by winter protection, for, although the strawberry plants are perfectly hardy and grow much farther north than this, in cultivated land the plants are liable to be thrown out by the frosts in the fall and spring, and some covering must be applied to prevent this. The materials most commonly used are coarse hay, straw, strawy manure, corn stover, pine boughs and pine needles, all of which are good.

If the cover or mulch is put on too early in the fall or too deeply, the plants will often be injured by heating, and for this reason the application is delayed until the ground is somewhat frozen. If the ground were covered with snow from December to April, little or no covering would be needed, but this is not often the case. Only a thin covering should be applied, just enough to shade the ground and prevent alternate freezing and thawing when there is no snow on the ground. When growth begins, the mulch may be removed, the land carefully cultivated until the fruit begins to approach maturity, when the mulch is put back to protect the fruit from the soil, or, as is the most common practice, left on the

ground, and when the plants begin to grow, drawn away from the crown. The quantity and quality of the fruit are undoubtedly improved by the former method, but it is doubtful if it is more profitable.

Gathering the Fruit.

For home use the fruit should be allowed to become thoroughly ripe before picking, and the bed should be picked over every day. Even for market the fruit can be allowed to become fully ripe, if it is carefully picked in the cool of the day, and is kept in a cool, dry place until it reaches the customers; and the problem of securing the local market to the local grower would solve itself, if only perfectly fresh ripe fruit were offered to the consumers.

Best Varieties.

The varieties of strawberries may be divided into two groups, *i. e.*, "pistillate," those with pistillate flowers only, and "perfect," those having flowers with both stamens and pistils. The pistillate flowered varieties generally are more productive than those with perfect flowers; but, if the former are planted alone, no fruit will be produced, therefore some staminate or perfect-flowered varieties must be planted near them. The proportion of the two kinds that are generally planted is about three rows of the pistillate to one of the perfect-flowered kinds. Of the thousands of varieties that have been introduced within the past ten years scarcely a half dozen have proved superior in all particulars to the old standard sorts, yet there has been considerable progress as to quality and size of berry. Some varieties succeed in one locality and not in another, and some on one kind of soil and not on another, so that it is very difficult to give a list of varieties that will succeed under all conditions. The best way for one to decide as to the best kinds to grow in a given locality is to consult successful growers in his own immediate vicinity. The list suggested that will probably give the best results under a great variety of conditions is as follows: Bubach (pistillate), Haverland (pistillate), Lovett (staminate), Leader (staminate), Clyde (staminate), Brandywine (staminate) and Parker Earle (staminate).

Annual Cropping.

It has now become the practice among the best growers to grow but one crop from a planting. The advantage of this is that it is easier to grow plants set in the spring up to fruiting, than to renew an old bed, the fruit is much finer and more of it, and a second

crop of cabbages, beets, celery, etc., may be grown after the strawberry crop is harvested, so that two crops are produced in the two years. It allows also of more frequent rotation.

The Currant.

No fruit is more highly prized during hot weather, is more healthful or more easily grown than the currant. It is a perennial fruiting shrub, and with proper care will continue producing fruit for a quarter of a century or more.

The Soil.

While the currant can be grown upon almost any soil, it succeeds best in a deep, rich, moist loam. It also succeeds under the shade of fruit and ornamental trees, provided an abundance of manure or fertilizer is used. The value of the fruit for market depends largely upon its size, and to produce large fruit a vigorous growth of the bushes must be produced.

Planting.

Early in the fall is the best time for planting currant bushes, though they succeed well if planted in the spring. No. 1 one-year-old plants are the best for planting, though No. 1 two-year-old plants are often used.

The distance at which they are planted varies somewhat with different growers and their mode of pruning. If the bushes are kept close pruned and are on a rather light soil, four by five feet is about the right distance; but if allowed to grow rather large and on rich land, four by six feet will be none too much space.

Cultivation.

A rich soil and clean cultivation must go together, for without the one the fruit will be of small size and without the other the weeds would soon choke out all growth of either the bushes or fruit.

Mulching.

No fruit is more benefited by an abundance of moisture than the currant, and a mulch of hay or coarse manure helps to keep in the moisture and the fruit from becoming soiled during heavy rain storms.

Pruning.

The currant produces its best fruit on strong, vigorous shoots, two or three years old, while that on the older wood is small and of inferior quality. It is therefore the practice in pruning to cut out all very old canes and encourage the growth of strong new shoots. This may be done at any time after the leaves have fallen, and before much growth in the spring, but the fall is the best time for this work.

Varieties.

There are many good varieties in cultivation, but they do not show so much variation as to form, size and color as the other kinds of fruit. Any of the leading sorts may be made to produce large fruit if grown in a rich soil and properly pruned. In fact, it is asserted by many that the only difference between many of the varieties is produced by the cultivation and fertilization. However this may be, it is conceded by the best growers that carefully selected plants of the several varieties do have distinct characteristics. Among the varieties most grown the best are the Cherry, Fay's Prolific, Red Dutch, Victoria and White Grape. The white currants are much less acid and of better quality than the red kinds, but are not so readily sold in the markets. The Victoria is said to be especially valuable, because of its hanging so long on the bushes after ripening.

Insects.

As with almost any crop on the farm or garden, the currant is injured by insects. The "currant worm" comes upon the bushes soon after the leaves begin to unfold, and in a few days destroys all of the foliage unless checked in its work. The best remedy is powdered hellebore, dusted over the bushes while the leaves are wet with dew or rain, or sprayed with water mixed at the rate of one tablespoonful of hellebore to a common two-gallon pail of water.

Fungous Diseases.

The failure of many a currant plantation to yield a profit has often been due to the leaves being destroyed by a leaf blight that first appears as small dots on the lower leaves. These increase in size and number, and soon cause the leaves to fall, preventing a full maturity of the canes and fruit buds. This injury is prevented by spraying with the Bordeaux mixture * just as the blossoms are set, and again as soon as the fruit is picked.

* See Bulletin No. 44, Hatch Experiment Station.

Red Raspberry.

The red raspberry is considered the most delicious of the small fruits. It brings the highest price in the market, and is also the most perishable. In the home garden it can be grown to perfection and be put upon the grower's table in a perfectly ripe condition, in which condition it would be impossible to transport it even to a near market, and in this condition it has an aroma and freshness seldom found in the fruit purchased in the market.

The Soil.

The best soil for the red raspberry is a deep, sandy loam, that is not seriously affected by drouth. In thin soils mulching or irrigation must be practised to insure a crop in seasons of drouth. On a light soil the canes mature better than on a heavy one, and are less likely to be injured during the winter. This injury is prevented by laying down the canes in the autumn before the ground freezes.

Planting.

The fall is the best time to plant the raspberry. The canes should be cut back to six inches before planting, and then one or two shovelfuls of soil or manure banked over them.

The raspberry is grown in rows where the cultivator can be run but one way, or in hills where it can be run both ways. Both methods give good results, the distances being four by six or three by five feet, according to the vigor of the varieties.

Fertilizers.

As with the strawberry, a liberal supply of plant food is a necessity, and bone and potash are equally valuable for the raspberry, and about the same quantity must be used. If the soil is very light, one hundred to two hundred pounds of nitrate of soda per acre will be found valuable.

Cultivation.

No fruit is more benefited by frequent cultivation. This keeps the soil cool and moist, the condition under which it grows the best. In this work the only care needed is not to cultivate too deeply, or to destroy too many of the new shoots as they come up in the spring; for it is better to have a surplus of canes to cut out at the fall or winter pruning than to have the land only partly stocked with canes.

Pruning.

The pruning the red raspberry requires for the best results is the pinching off the ends of the canes during the summer as soon as they are two and one-half feet high, which causes a branching, tree-like growth. The fruiting canes are also to be cut out as soon as the fruit has been gathered, and the laterals of the new growth to be headed in at any time after the leaves drop in the fall or before the beginning of growth in the spring. All very small canes should be cut out, as they produce only small fruit, and this being near the ground is so injured by dirt as to be of no value. The fruit also on the large canes is benefited by this thinning. When the pruning is completed, the strong canes should stand from *six* to *eight* inches apart, and the greater the number of these strong canes the larger will be the crop.

Renewing the Plantation.

Perhaps no fruit sooner exhausts the soil or the soil conditions under which it is profitably grown than the raspberry. The roots and suckers permeate the soil in all directions, and after a few years the plantation must be renewed, or an increasing amount of plant food be applied. Six to ten years is about the limit of profitable growth in one place, when a new plantation should be started on fresh soil.

Varieties.

There are but very few varieties of the red raspberry that can be successfully grown under the average conditions and care. Of these, the Miller, Cuthbert, Loudon and Golden Queen will give the greatest satisfaction for home use or market.

Insects and Fungous Pests.

There are no insects that are seriously injurious to the raspberry under ordinary conditions, but a fungous known as the leaf blight often causes serious damage. This disease first appears as small, reddish spots, which soon increase in size and number until the whole leaf is infested, when it turns brown and falls off, a few of the upper leaves only escaping; where this leaf blight comes on early it often so weakens the canes that the fruit is small and the plantation soon dies out. The remedy is spraying thoroughly with the Bordeaux mixture just before the blossoms open, and again as soon as the fruit has been gathered.

Winter Covering.

The canes of even the most hardy varieties are sometimes winter-killed and the crop seriously injured or wholly destroyed. This injury can be certainly prevented by covering the canes with soil in the fall just before the ground freezes. Only a light covering of soil is needed, just enough to hold the canes down to the ground. In the spring the canes should be uncovered as soon as the frost has come out sufficiently, for, if allowed to remain on the ground, they start into growth too early, and will not stand up as readily as if raised earlier.

The Black-cap Raspberry.

In a general way the black-cap requires about the same treatment as to soil, cultivation, training, pruning and fertilization as the red raspberry. It is considered less desirable for home use and less profitable for the market than the latter, but is more easily grown and produces a very much larger quantity of fruit. It also grows in hills, and does not give any trouble from suckers.

Planting.

The black-caps are propagated by the rooting of the ends of the canes in the fall, and should be set out only in the spring. Great care should be exercised in planting them not to set the "tips" too deeply, as the buds from which new canes will grow are liable to injury by deep planting. A very large per cent of the black-cap tips planted fail to grow from this cause. A mound or a ridge between two furrows is made, the roots are spread out with the bud on the highest part of the mound or ridge, the soil is then pressed *very firmly* about the roots and only *moderately firm* about the buds. The bud of the tips should not be covered with more than an inch or two of soil, varying this with its character, but the roots should be well down in the moist soil. Planted in this way, every "tip," if in good condition, will be sure to grow.

Pruning.

The pruning, training, cultivation and fertilization required for the black-caps are the same as for the red raspberry, and spraying for insect and fungous pests should be the same.

Varieties.

As with the other small fruits, some varieties succeed in one locality or condition of soil and fail in others, and the same rule should be followed as with the strawberries in the selection of varieties. The varieties that will most generally succeed are the Souhegan, Cromwell, Ohio, Kansas, Gregg, etc.

Hybrid Raspberries.

A class of raspberries known as "purple caps" or "hybrids" are now considerably grown, and are especially valuable for the home garden, but on account of their color are of no value for market. In habit of growth they are like the black-cap, propagating by tips, but produce a fruit intermediate between the latter and the red raspberry in color, and of the substance and flavor of the latter, being considered even superior to either in quality. The plants of the varieties now most grown are not quite hardy, the canes are generally more or less winter-killed, and are rather difficult to cover on account of the strong growth of canes; but, even when the main canes are killed nearly to the ground, lateral shoots will often come out that produce a fair crop of fruit. When not injured, the crop is often enormous. Of the varieties most grown, the Shaffer and Columbian are the leading sorts. They are attacked by the same leaf blight that injures the red and black-cap raspberries, and should have the same treatment.

The Blackberry.

This very healthful and delicious fruit is easily grown, produces a large crop, and, but for its habit of spreading over the garden, would be more generally planted. This difficulty, however, is easily overcome if all suckers that come up outside the prescribed limits of the rows or hills are treated as weeds, and are *pulled* up instead of being cut off at the surface as is the common practice. It should never be planted in the corner of the garden, where the suckers can run out into other land, but if possible in the centre of the garden, where it can be seen upon all sides.

Soil.

The soil it requires for its best growth is about the same as for the red raspberry, though it will succeed fairly well upon any soil, if not full of standing water. In a heavy undrained soil

they are more likely to winter-kill than upon one of a sandy or gravelly nature, while upon the latter they need an extra amount of plant food.

Planting and Training.

The time of planting, method of training and pruning are the same as for the red raspberry. The distance at which they are planted varies from two to four by eight feet where to be grown in rows, to five by eight feet where to be grown in hills. In fertilizing the blackberry field or plot the same kind and quantity of fertilizer should be used as for the red raspberry.

Varieties, Insects and Diseases.

The varieties best adapted to the home garden or the field are the same, and the Agawam, Snyder, and Taylor's Prolific are certainly the best of those fully tested. No insects interfere seriously with its growth, but the fall and spring "orange rust" is often abundant and destructive. Spraying as for the raspberries will in a measure overcome it, but it is better also to cut out all rusted canes and leaves as soon as they appear.

MASSACHUSETTS

CROP REPORT

FOR THE

Month of June, 1897.

ISSUED BY

WM. R. SESSIONS,

Secretary State Board of Agriculture.

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Crop Report for the Month of June, 1897.

Office of State Board of Agriculture,
Boston, Mass., July 1, 1897.

Bulletin No. 2, Crop Report for the month of June, is herewith presented. Particular attention is called to "Three Shade-tree Insects," a special article by A. H. Kirkland, M.S., assistant entomologist to the committee on gypsy moth, insects and birds, which is printed at the close of the bulletin.

Progress of the Season.

Report No. 149 (June, 1897) of the Statistician of the United States Department of Agriculture gives the net aggregate acreage of winter wheat as 21,562,000 acres. This is 94.6 per cent of that harvested last year, as against a percentage of 105.2 reported sown, the decrease being caused by extensive abandonment owing to winter-killing. The average condition is now 78.5, having fallen 1.7 points during May, but it is still 0.6 point higher than last year. The acreage of spring wheat is 110 per cent of last year's, much winter wheat having been ploughed up and re-seeded to spring. The average condition is 89.6, against 99.9 last year. The total wheat acreage is 34,569,000 acres, a reduction of 0.1 per cent from last year, and the average condition is 82.7, against 87.6 last year.

The area of oats is 93.3 per cent that of last year, the cause of decrease being the low price of oats last year and unfavorable weather at planting time. The average condition is 89, against 98.8 last June.

The acreage of barley is 92.2 per cent that of last year, the cause of the reduction being the same as for oats. The average condition is 87.4, against 98 last year.

The rye acreage is greatly reduced in the great central region, bringing the general average acreage for the country

down to 93. The general average of condition is 89.9, against 85.2 in June, 1896. The crop has been retarded by the cold weather, and has also been injured by grasshoppers in Michigan and by the army worm in Iowa.

The acreage of cotton shows a general increase, the average percentage being 103.5 of last year's, making a total of 24,091,000 acres. The condition is very low throughout and almost uniform, being 83.5, against 97.2 last year. The condition is largely due to the cold and unfavorable weather, though there has also been some injury from insects.

Rice shows an increase in acreage for the whole county of 3.1 per cent and a condition of 98.8, as against 90 last June.

The acreage of clover is increased 2.6 per cent over last year, this seeming due partly to increased appreciation of clover as a forage crop and partly to favorable weather conditions, which insured a good catch. The average condition is 96, against 88.4 last year, the weather having been unusually favorable to this crop.

The average condition of spring pasture has advanced from 93.4 in May to 96.7, against 94.5 a year ago. The condition is high along the North Atlantic coast and comparatively low along the South Atlantic coast. In north central and western sections a high condition prevails. Deficient moisture is the cause assigned where the condition is unsatisfactory.

The average condition of apples was 74.8, 3.8 per cent higher than last June, but commercially the present situation is apparently less favorable than a year ago, the condition being lowest in the most important States. The season has been too cold and wet for fruit, and bad dropping is already reported in the earlier States.

The general average condition of peaches is 67, as against 64.7 last June. In general the present prospects appear to be poorer than for any year since 1890, except 1894. The outlook is best in Connecticut, New Jersey, Maryland and California.

In Massachusetts the acreage of rye compared with last year is given as 92 and the average condition June 1 as 98; the acreage of oats as 100 and the condition as 100; the acreage of barley as 94 and the condition as 97; the acreage of clover as 102 and the condition as 113; the average

condition of spring pasture as 112; the average condition of apples as 62, and of peaches as 76.

Temperature and Rainfall for the Whole Country.

[From United States Weather-Crop Bulletins.]

Week ending May 31. — Week cooler than usual generally in all districts east of the Rocky Mountains, being decidedly cool in the lake region, central valleys and Middle Atlantic States. Generally through the Rocky Mountain, plateau and Pacific coast regions the week was warmer than usual. Freezing temperatures occurred in the upper Missouri and Red River valleys. The week was drier than usual throughout much the greater portion of the country, the exceptions being New England, portions of the Middle Atlantic States and limited local areas elsewhere in the country. In New England the actual rainfall ranged from 1 to 3 inches, and on the east coast of southern Florida more than 8 inches fell. The week was generally unfavorable for plant growth, being too cool, too dry in the southern States and too wet in New England. The week was unfavorable for corn, being much too cool for germination and growth. The conditions were generally favorable to winter wheat. Spring wheat suffered from frosts in the Dakotas, but elsewhere did well. Tobacco planting progressed in the States of the Ohio valley.

Week ending June 7. — Week cooler than usual throughout the country, with the exception of the Pacific coast regions, the South Atlantic States and southern Texas. Freezing temperatures occurred in the Dakotas and over the northern portions of Minnesota, Wisconsin and Michigan. The week was drier than usual over the lower lake region, Ohio valley and over the greater portion of the Atlantic coast and east Gulf States. More than the average weekly rainfall occurred over large areas in the interior and over northern New England. The week was unseasonably cool and unfavorable to crop growth throughout the central valleys, lake region, New England and Middle Atlantic States. Throughout the central and northern districts corn made but slow growth. Cotton made but slow growth and the crop was backward. Reports from winter wheat were

generally favorable, but abnormally cool weather retarded the growth of spring wheat.

Week ending June 14. — Week slightly cooler than usual in the west Gulf States, the Ohio valley, over portion of the upper Missouri and upper Mississippi valleys, the greater portion of the lake region and in the Middle Atlantic States and New England. On the South Atlantic coast and generally throughout the Rocky Mountain and Pacific coast regions the week was warmer than usual. It was the first week of the season without freezing temperatures at some of the more northerly Weather Bureau stations. Over much the greater part of the country the week was dry. Over the northern portions of the Middle Atlantic States, the greater part of New England and limited areas elsewhere the rainfall exceeded the average. More than 2 inches of rain fell in portions of New England. Corn, while generally backward, made good progress in the principal corn States. There was also a general improvement in the condition of cotton. Winter wheat continued to improve and spring wheat experienced some improvement.

Week ending June 21. — Week cooler than usual on the Pacific coast, in the Rocky Mountain regions and from the upper lake region to the New England coast. Over the central valleys and South Atlantic coast the week was warmer than usual. The week was drier than usual in the west Gulf States, Florida, over the northern portions of the east Gulf States, the greater portion of the Mississippi and Missouri valleys, the lower lake region and southern New England. Elsewhere the rainfall generally exceeded the average. The week was generally very favorable for the growth and cultivation of crops. Corn made vigorous growth in the principal corn States. Cotton made good growth generally throughout the cotton belt. Conditions were very favorable for winter wheat and spring wheat generally did well. The condition of tobacco was generally favorable.

Special Telegraphic Reports.

[Weather Bureau, Boston.]

Week ending May 31. — New England. Boston: Excessive and almost constant rains in northern sections caused

complete suspension of work; frequent rains in south benefited rye, oats and grass, but retarded corn growth; considerable tobacco set; grass promises heavy crop.

Week ending June 7. — New England. Boston: Another unfavorable week, cool, cloudy and wet; season very backward in Maine; seeds germinating slowly; some corn rotting in the hill; present conditions, causing tobacco plants to turn yellow and die, may result in decreased acreage.

Week ending June 14. — New England. Boston: Continued cool and wet; excessive rains on 9th and 10th flooded meadows and washed hillsides in central districts; work much delayed; field crops growing slowly; much seed rotting.

Week ending June 21. — New England. Boston: Higher temperature, more sunshine, less rain; all crops improving; haying begun in south and excellent crop indicated; tobacco being set under favorable conditions.

Weather for June, 1897.

The month of June opened unfavorably for the farmer. During the week ending on the 7th, the weather was too cool and wet for a good growth of any crop. There was very little sunshine, and the need of this was severely felt. The temperature ranged about normal throughout the first four days, although on several mornings the mercury registered below 50°, and there was a narrow escape from frost in low places on the 2d. Frequent rains, accompanied by hail and high winds in some localities, occurred, although, as a rule, the precipitation was not heavy.

The week ending with the 14th brought no improvement in the general conditions, but on the contrary the situation was nearly at the worst. Only one clear day occurred during this period, and with the cool temperature and the rain all crops were greatly retarded. An exceptionally heavy rainfall came on the 9th and 10th. At Leeds, 4.20 inches fell on these two days, causing fully 75 per cent of the meadows to become overflowed. At that place the Connecticut River was higher than in any previous June. A large rainfall was also recorded in eastern sections of the State, the measurement at Boston being slightly more than

two inches. The temperature averaged a daily departure below the normal of 8°, and by the 14th it was more than 100° deficient for the month, while the precipitation was greatly in excess of the usual amount.

The week ending with the 21st was the most favorable of the season up to that time, still the lack of sunshine was a detrimental factor. Several days were favorable for haying. The temperature averaged about normal, and the rainfall consisted of light showers on three days. The nights were too cool for corn growth, and the mornings of the 17th and 19th were especially cool, the temperature falling below 50° in all but coast sections.

A very satisfactory week was that which ended with the 28th. The rainfall was very light and much sunshine predominated. A warm spell set in, commencing with the 22d, when the temperature rose to 80°, and terminated on the 25th with maxima of over 85°. The month closed, however, with a considerable deficiency in temperature, the losses of the first half not having been made up.

In the circular to correspondents, returnable June 25, the following questions were asked: —

1. What insects are proving injurious in your locality?
2. How is Indian corn looking, and what is the acreage as compared with previous years?
3. Has haying begun and what is the prospect for the crop?
4. How does the acreage of early potatoes compare in yield and price with previous years, and what is the promise for the crop?
5. How do early market-garden crops compare in yield and price with former years, and what is the prospect for those not yet harvested?
6. How do the quantity and price of dairy products and the supply and price of dairy cows compare with former years?
7. What is the condition of pasturage in your locality?
8. What is the outlook for such fruits and berries as are grown for market, naming them?

Returns have been received from 194 correspondents and from them the following summary has been made up: —

Insects.

No serious damage from insects is reported and, on the whole, they appear to be considerably less injurious than usual. This is probably due to the cold and wet weather of the month, which naturally operated to hold them in check and reduce their ravages. Potato bugs and cut worms are the insects most generally reported, and about sixty correspondents mention the presence of each insect. Canker worms, tent caterpillars and currant worms are also often reported, and the small striped squash bug appears to be doing considerable damage to all kinds of vines. Other insects spoken of are onion maggots, rose bugs, white grubs, asparagus beetles, cabbage maggots, spittle insects, horn flies, wire worms, plant lice, cranberry vine and fire worms and the curculio.

Indian Corn.

About the usual acreage of Indian corn was planted, but there is considerable complaint of failure to germinate caused by the cold, wet weather. This has necessitated replanting in many sections, and there have been some cases of entire abandonment. Probably the result will be seen in rather a decreased crop than a decreased acreage, but nevertheless some slight decrease of acreage exists. Other results of the unseasonable weather have been a poor stand, slow growth and an uneven crop of poor color. At the present writing the prospects for this crop are not flattering.

The Hay Crop.

At the time of making returns haying had hardly commenced in any section. Some few fields had been cut, but the general opinion seemed to be that the crop would benefit greatly by about a week more of growth, particularly should the weather be warm and bright. The conditions which worked to retard the corn crop were very favorable to grass, and the prospect is that the crop will be one of the best ever secured. Some complaint is made of poor quality caused by too rapid growth and too much moisture, but with good weather this will be remedied by the time cutting is fairly under way.

Early Potatoes.

The acreage of early potatoes is about as in previous years, and the crop generally promises well, though somewhat backward. There is some complaint of seed rotting in the ground, but this can hardly be called general. Those planted on light land have done best thus far, those on wet land having suffered from the excess of moisture.

Market-garden Crops.

Early market-garden crops, like most other crops, are late and growing slowly, but where harvested the yield was usually spoken of as satisfactory. Prices rule about as usual, with perhaps a slight upward tendency for some crops. Later crops, where reported on, are generally said to promise well.

Dairy Products.

There appears to be a slight increase in the sum total of dairy products, probably due to the excellent feed in pastures. This increase is felt first in the supply of milk, there being a surplus in many sections. Prices continue the slight but steady decrease noted for the last few years. Where milk finds sale the price still holds up, but the surplus of milk must be turned to the manufacture of butter, thus making the sale of this commodity still more difficult. In striking contradiction to the prices of dairy products the price of dairy cows still continues good; a consolidation of the returns showing, if anything, a slight general increase, while the supply is, on the whole, none too great for the demand.

Pasturage.

Pasturage has benefited from the same conditions that helped grass generally and was never better at this time of year. Pastures which have suffered severely from drought in previous years have found the heavy rains particularly welcome, and in many cases have almost recovered from what appeared to be permanent injury.

Fruits and Berries.

Strawberries are generally said to be a good crop, with prices average, but the quality of the early berries suffered somewhat from the wet weather and lack of sun, and the crop has been generally delayed in ripening. Raspberries, blackberries and currants promise remarkably well. Pears, plums and cherries promise good average crops. Apples promise well for an off year, though there will be but very few Baldwins. Peaches will not be a full crop, but present indications point to there being more harvested than for several years past. It is too early to predict as to cranberries, but present indications are good. Wild berries of all kinds seem likely to fruit very heavily.

NOTES OF CORRESPONDENTS.

(Returned to us June 23.)

BERKSHIRE COUNTY.

New Marlborough (L. P. Keyes). — Insects are doing very little damage in this locality. The stand of Indian corn is fair, but the crop is very backward. Haying has begun and a large crop seems assured. About the usual acreage of early potatoes was planted and they are looking very promising. Dairy products are a shade lower in price; dairy cows are scarce and are selling at good prices. Pastures never were better and stock is looking well.

Otis (S. H. Norton). — Currant worms and cut worms are proving injurious. Corn is very backward, but there is about the usual amount planted. Haying has not begun, but there will be a large crop. About the usual acreage of early potatoes has been planted. Dairy products are fully up to the average in quantity and price. Feed in pastures is the best it has been for years. Owing to the cold wet weather everything except grass is very backward.

West Stockbridge (Wm. C. Spaulding). — Potato bugs and currant worms are plenty. Corn is rather backward and crows have been troublesome; acreage about as usual. Haying not begun, but prospect excellent for a large crop. Acreage of early potatoes about as usual and promise for the crop good. Quantity and price of dairy products about as usual. Pasturage is in excellent condition. Fruits and berries promise well.

Washington (E. H. Eames). — Corn is all up, but is very late; acreage about as in previous years. Haying has not begun, but the best crop for three years is promised. Acreage of early potatoes about as usual and the prospect is very good. Early market-garden crops about as usual in yield and price. Dairy products about average in quantity and price. Pastures are in good condition. Wild berries of all kinds are plenty.

Peru (J. B. Sennett). — Potato bugs are doing some damage. Corn is small for the season and but little is raised except for silos.

Haying has not commenced, but the prospect is good for a large crop. Early potatoes are not far enough advanced to show what the result will be. Dairy products are about as in former years, with a tendency to lower prices; prices of cows about as usual. Pasturage is in good condition. Apples promise a large crop and wild berries promise to be plentiful.

Hancock (C. H. Wells). — Tent caterpillars and currant worms are doing some damage. Indian corn has a smaller acreage than usual and is looking very sickly. Haying has not begun, but the prospect for the crop is good. Few early potatoes raised. Quantity and price of dairy products about the same as last year. Pasturage is in good condition. Plums and cherries promise a fair crop and apples medium. There was a slight frost on the 21st but no damage.

New Ashford (E. Ingraham). — Potato bugs are doing some damage. Indian corn is small and backward. Haying has not begun, but grass looks finely. The usual acreage of early potatoes has been planted and they are looking finely. More butter is produced than ever before and prices are lower. Pasturage is in fine condition.

FRANKLIN COUNTY.

Monroe (D. H. Sherman). — Tent caterpillars are doing some damage. Indian corn is very late, owing to cold weather and rains; acreage about as usual. Haying has not begun, but the prospect for the crop is more than average. It is still too early to report on early potatoes or market-garden crops. Price of dairy products lower than usual with supply fair; no sale for dairy cows. Pastures are in good condition. The outlook is good for fruit, and wild berries promise to be a big crop.

Heath (O. D. Canedy). — Potato bugs are doing some damage. Corn is looking pretty slim and the acreage is about the same as usual. Haying has not begun much yet, but the yield will be fair. Potatoes are very backward. Quantity of dairy products good, prices low; cows rather high in price. Pasturage is in very good condition. Apples are about the only fruit raised for market.

Shelburne (G. E. Taylor). — The acreage of Indian corn is larger than usual, but it is very small, uneven and with a poor stand. Haying has not begun, but there is the prospect of an unusual crop. The acreage of early potatoes is about average and a fair crop is promised. Good cows bring high prices; dairy products are in excess of the demand and prices are low. Pastures are in fair condition, much better than for the last four years.

Ashfield (Chas. Howes). — Cut worms and potato bugs are doing some damage. Corn is very small for the time of year; acreage increased. Some hay is being cut this week and next week haying will be in full blast. Acreage of early potatoes about as usual and looking fairly well. Garden crops are mostly late. Cows are doing better than usual and are holding up in price. Pastures are unusually good. Strawberries are quite plenty and raspberries and blackberries are looking well.

Whately (Frank Dickinson). — Cut worms are doing some damage. The cold wet weather is turning corn yellow; acreage not as great as last year. Haying is just beginning, with the prospect of a good crop. Acreage of early potatoes about the same as usual and they are looking finely. Early market-garden crops have not made as large a yield as in some years; with warm weather the prospect for later ones is good. Price of dairy products low; supply of cows short and prices high. Pastures are in good condition. Strawberries are not as good as usual and other fruits are below the average.

Sunderland (J. M. J. Legate). — Cut worms and onion maggots are working quite badly. Corn is very backward and much had to be replanted, owing to the cold and wet weather; acreage about as usual. There will be a heavy crop of hay, though but little has yet been cut. About the usual acreage of early potatoes, but the crop is backward. Pasturage is in fine condition. There is a good strawberry crop, and apples and plums are well set, but there are few peaches. All crops except grass are backward and we must have a change soon if results are to be satisfactory.

Erving (C. F. Clark). — Tent caterpillars are doing some damage. Indian corn is looking well but is late; acreage about as usual. Haying has begun and the prospect is good for a good crop. Acreage of early potatoes about as usual and prospect good. Market-garden crops promise well. Dairy products are about as usual in quantity and price. Pasturage is in good condition.

New Salem (Daniel Ballard). — Currant worms, potato bugs, squash bugs and tent caterpillars have all proved troublesome. There is about the usual acreage of corn but it is very backward, and much had to be planted over. Haying hardly begun, but the prospect now is for a heavy crop. There is about the usual acreage of early potatoes; crop backward but looking promising. Dairy products are abundant and prices rather low; supply and price of cows compare favorably with former years. Pastures are in excellent condition. Strawberries are a fair crop and blackberries promising.

HAMPSHIRE COUNTY.

Pelham (J. L. Brewer). — Tent caterpillars and potato beetles are doing some damage. The usual acreage of Indian corn was planted, but the crop is very backward. Haying has not begun, but a first-class crop is promised. There is about the usual acreage of early potatoes and those planted on light soil look finely. Some market-garden crops have suffered from the continued rains but the prospect is fair. The supply of dairy products is up to the average and prices are lower. Pasturage is in first-class condition. Strawberries are abundant and blueberries promise well.

Amherst (F. S. Cooley). — Onion maggots and striped squash bugs are doing some damage. Corn is backward and much seed has rotted, owing to wet weather, so that replanting is necessary in many places. Haying has not begun, but the crop promises unusually well. The acreage of early potatoes is the same as in former years, but there is much complaint of the seed rotting in the ground. The tendency in price of dairy products is downward while the supply is not diminishing. Pasturage is in excellent condition. Strawberries are fine ; raspberries and currants promise well ; later fruit, peaches, pears, apples, grapes, plums, etc., give ordinary promise.

Hadley (L. W. West). — Cut worms, wire worms and tent caterpillars have proved injurious. Indian corn is very backward, with about the usual acreage. The acreage of early potatoes is smaller than usual, with the promise for the crop doubtful. Yield of early market-garden crops good, prices low, and prospect for later ones average. Quantity of dairy products larger and prices lower ; prices of dairy cows high. Pastures are in good condition. Strawberries, blackberries and raspberries promise well.

Easthampton (Wm. C. Clapp). — Onion maggots, squash bugs and asparagus beetles are doing some damage. Indian corn is backward, but the acreage is about as usual. Haying has not begun, but the prospect is for more than an average crop. Acreage of early potatoes larger than usual and vines are looking well at this date. Early market-garden crops made a full yield and the prospect is good for later ones. Quantity of dairy products large, prices low ; dairy cows plenty. Pastures are looking well. Blackberries and raspberries show a full bloom and strawberries have been very plenty and cheap. Tobacco is all set, with a larger acreage than usual.

Westhampton (F. A. Bridgman). — Caterpillars and potato bugs are doing some damage. Corn is not forward and the acreage is

about as usual. Haying not much under way as yet, but the prospect is good. Acreage of early potatoes about the same as usual. Price of dairy products low. Pasturage is in poor condition, brush growing too fast to be kept down. Apples are not very plenty, but other fruits and berries promise a good crop.

Goshen (Alvan Barrus). — Corn came up badly and is thin and late. Haying hardly begun, but a superior crop is promised. There is a small acreage of early potatoes, but the crop promises well. The quantity and price of dairy products are slightly below the average. Pasturage is in A No. 1 condition. The outlook for fruits and berries is not very promising.

Chesterfield (Horatio Bisbee). — Corn looks poorly; acreage about the same as in previous years. Haying has not begun to any extent, but grass looks well. Potatoes are looking well and there is no particular change in acreage. Quantity of dairy products fully up and price low; cows are getting scarce and are beginning to cost more. Pasturage is in good condition. Wild berries promise well.

HAMPDEN COUNTY.

Granville (Joseph Welch). — Cut worms are doing some damage. Indian corn is looking badly, the crows and wet weather having almost ruined it in some places. Haying has not yet begun, but a good crop is promised. The price of butter is way down and the price of cows up, $35 to $50 each. Pasturage is in very good condition. Berries are late, but there will be a large crop of both low and high bush blueberries and blackberries have blossomed well.

Westfield (C. F. Fowler). — Corn has a poor stand and is backward, owing to the wet and cold weather. Haying has just begun, with a large crop. The acreage of early potatoes is rather below the average; a few pieces look remarkably well but the majority are late. The yield of early market-garden crops is good, with a tendency to over-production and low prices. The supply of dairy products is fully up to the demand, but prices are low. Pasturage is exceptionally good. Apples will be a fair crop, strawberries plenty, cherries very scarce; plums well set, but many trees are being ruined by lice.

West Springfield (T. A. Rogers). — Indian corn is about two weeks late; full acreage planted. A few pieces of hay have been cut and the growth is heavy. There is about the usual acreage of early potatoes and they are generally looking well. Market-garden crops of all kinds abundant and prices low. Quantity of dairy products fully up and prices down; good cows are high when com-

pared with the price of their products. Strawberries have done well, blackberries and raspberries are in full bloom, cherries and currants full, plums good, apples few and pears about average.

Agawam (R. De Witt). — Potato bugs and striped squash bugs are doing some damage. Corn looks poorly and is slow in coming; acreage a little less than usual. Haying has hardly begun, but the crop looks big. The acreage of early potatoes is fully up, with a good many poor looking pieces. Pasturage is looking well. Clover is splendid this year and new seeding of herds'-grass is excellent.

East Longmeadow (J. L. Davis). — Potato bugs and onion maggots are doing some damage. Indian corn is backward, with about the usual acreage. Haying has just begun and a first-class crop is assured. The acreage of early potatoes is increased 10 per cent, but they are not coming up well or making good progress. The price of milk is the same as last year and cows command a high price. Pastures are in good condition. Strawberries and blackberries promise well; apples, peaches and plums are well set and doing well.

Wilbraham (H. M. Bliss). — Canker worms are doing some damage. Corn is very backward, with about the usual acreage. Haying has begun and the prospect for the crop is good. The acreage of early potatoes is decreased 10 per cent, but they are looking well except on low land. Butter and milk are lower than usual in price; cows bring from $35 to $50, about the same as last year. Pasturage is in very good condition. Strawberries and blackberries promise good crops.

Wales (C. F. Crawford). — Potato beetles are doing some damage. Corn is small and backward, with about the usual acreage. Very little haying has been done yet, but the prospect is good. Potatoes are doing fairly well, with about the usual acreage. Most vegetables are backward. Butter is hard to sell, with prices about as usual; cows are scarce and high. The quality of pasture grass is not as good as usual. Apples will be a moderate crop, but other fruits and all wild berries promise well.

WORCESTER COUNTY.

Southbridge (G. L. Clemence). — Cut worms are doing some damage. Corn is very backward, 40 per cent having to be replanted; acreage about as in previous years. No hay cut yet, but the crop is the largest in many years. The acreage of early potatoes is about as usual, but seed rotted badly on wet land. Early market-garden crops are about average, with a little lower prices.

The prices of both dairy cows and their products are about as in previous years. Pasturage is in good condition.

Brookfield (F. E. Prouty). — Cut worms and currant worms are doing some damage. Corn is backward, but the acreage is larger than in former years. But little haying has been done and the prospect is good. The acreage of early potatoes is about the same as usual and the prospect for the crop is good. Butter is lower in price than formerly and milk the same. The supply of dairy cows is short and prices high. Pasturage is in good condition. Strawberries are a good crop and other berries look well.

New Braintree (C. D. Sage). — Little damage from insects. Corn is very backward and the stand rather poor; acreage perhaps 75 per cent of last year's. A little haying has been done and the prospect is excellent. The acreage of early potatoes is perhaps three-fourths that of previous years and they promise well. Quantity of dairy products fully up and prices a little off; little demand for cows and prices about as usual. Pasturage never looked better. Apples promise about half a crop. More sunshine is needed to sweeten and mature the grass crop before cutting.

Petersham (S. B. Cook). — Tent caterpillars, cut worms and striped squash bugs are doing some damage. Indian corn is very backward, owing to wet weather, but the acreage is about as in previous years. Haying has begun and the crop will be a full average. The acreage of early potatoes is 10 per cent above the average and a large crop is promised. Early market-garden crops are about as usual in yield and price. Dairy products 10 per cent greater than formerly and price the same; supply of cows 5 per cent less and prices somewhat higher. Pasturage is in very good condition. Strawberries, raspberries, blackberries, blueberries and currants will be plenty and cherries few.

Westminster (I. Dickinson). — Potato beetles, cut worms and squash bugs are doing some damage. Corn is very backward and not as much as common has been planted, owing to wet weather. Not much haying has been done yet, but the prospect is excellent. The acreage of early potatoes is less than in previous years and the prospect is uncertain as many are not out of the ground. All market-garden crops are late and the results are hard to predict. Pasturage is in good condition. Pears, cherries, strawberries and blueberries are very abundant. The weather has been much too wet and cold.

Gardner (A. F. Johnson). — Indian corn is very backward and a good deal had to be planted over; slight increase in acreage. Haying has not yet begun, but the prospect for the crop is good. The usual acreage of early potatoes has been put in and the pros-

pects are good. Quantity of dairy products large and prices low; cows plenty and higher price. Pasturage is in good condition.

Ashburnham (Albert Needham). — Texas flies are troubling cattle and cut worms are doing some damage. Corn is backward and the acreage fully as large as usual. Some are cutting clover, but other grass will not be fit to cut until about July 1; crop larger than common. Acreage of early potatoes about the same as usual, but it is too early to tell what the crop is likely to be. Dairy products are in excess of the demand and prices are low; extra fine cows are from $35 to $45. Pasturage is in first-class condition.

Bolton (H. E. Babcock). — Potato beetles and squash bugs are doing some damage. Corn is very backward on account of cold and wet weather and the acreage is hardly up to the average. A few have begun haying and the prospect is good for an excellent crop. Early potatoes are about an average acreage and are looking well. Quantity of dairy products good and prices low; supply of cows rather short and prices high. Pasturage was never better. Blackberries and strawberries are the principal berries and promise good crops.

Clinton (P. B. Southwick). — Canker worms, rose bugs and potato beetles are doing some damage. The acreage of Indian corn is below average on account of wet weather and it is very small and yellow. Not much haying done as yet, but the crop will be more than average. Not as many early potatoes planted as usual and in many places they have come up very unevenly. Early market-garden crops will be late and on wet lands look badly. Dairy products are a fair average in quantity and price. Pasturage is much above the average. Strawberries are a fair crop, blackberries and currants are setting well.

Worcester (H. R. Kinney). — There seem to be about enough insects to eat up most garden crops just now. Indian corn is very late and yellow, owing to the wet and cold weather; more planted for ensilage than usual. Little grass has been cut, but it is very heavy. There is about the usual acreage of early potatoes and they are looking well. The yield of market-garden crops is fair, but they have sold slowly at low prices. There has been a liberal supply of dairy products and the market has been dull, especially for milk. Pastures are in the best condition. Strawberries only promise a fair crop; raspberries and blackberries blossomed full; pears, plums and peaches promise good crops; quinces look well.

Southborough (E. F. Collins). — Potato bugs and cut worms are doing some damage. Corn although small is improving; acreage about as last year. Haying has just begun, with the prospect

of a large crop of good quality. More potatoes have been planted than usual and they look remarkably well. Prices of both dairy cows and dairy products are a little lower with the supply large. Pasturage is in excellent condition. Peaches look very large for the time of year and will be a full crop; apples few but looking well.

Douglas (Wm. Abbott). — Not much trouble from insects. More Indian corn than usual is planted, most of which is up from one to four inches. There is prospect of the largest hay crop for years. Potatoes are looking well and about the usual amount are planted. Early market-garden crops are rather backward and none are ready for market. Price of dairy products rather lower than in former years. Pasturage is in good condition. Strawberries never were a better crop; blackberries and huckleberries promise well; apples and pears light; plums promise well.

MIDDLESEX COUNTY.

Ashby (Anson Wetherbee). — Insects doing little damage at present. About two-thirds the usual acreage of Indian corn and it is now looking hard. Hardly any haying has been done as yet. The acreage of early potatoes is hardly up to the last few years, but the crop promises to be very good. The yield of early market-garden crops is about as usual and the prospect for good prices is fair. There is a full supply of milk and butter; not as many cows in this section as in former years. Pasturage is in very good condition. The outlook for peaches and pears is good; grapes are in full bloom; strawberries, raspberries and blackberries will be good crops.

Pepperell (G. H. Stewart). — No insects worth mentioning except potato and squash bugs. Indian corn is looking poorly, with about the usual acreage. Haying has begun, with prospect for a heavy crop of poor quality. There is a slight increase in the acreage of early potatoes, with prospect of a poor crop. Early market-garden crops below last year in yield, and prices about the same. Dairy cows are plenty, but high in price. Pastures are good on account of the rains. The outlook is poor for fruits and berries.

Chelmsford (P. P. Perham). — Tent caterpillars and currant worms are doing some damage. Corn is very backward and the acreage is less than usual. Very little grass has been cut as yet, but the outlook for a large crop was never better. Acreage of early potatoes large, with promise of a large crop. Early market-garden crops are rather late, but prices average well with former years. Dairy products are very low in price; good cows bring

rather more than formerly. Pastures were never in better condition. Outlook for apples very poor; blackberries and strawberries promise well for a large crop.

Carlisle (E. J. Carr). — Cut worms and canker worms are doing some damage. Indian corn came up poorly and is very backward; acreage about as usual. No haying done yet, but prospect of a big crop. Rather more early potatoes were planted than usual and they are looking well where the land was not too wet. Asparagus has brought good prices; yield somewhat smaller than last year. Milk has been a full supply, which has made the price low; cows plenty and price average. Pastures are in the very best condition. Strawberries looking well though rotting some; full bloom of blackberries; peaches and plums looking well.

Concord (Wm. H. Hunt). — Corn is backward from cold weather and much of it had to be replanted; acreage same as last year. Very little hay has been cut yet, but the crop is good. Acreage of early potatoes average and crop looking well. Asparagus was a very small crop, but prices have been good. Dairy products are a little lower than in former years, but cows are high. Pasturage is in good condition. Blight on strawberries, materially reducing the yield of some fields; currants promise well; very few apples; pears and peaches a full crop.

Winchester (Marshall Symmes). — Cut worms are our worst insect, but squash bugs are plenty. Haying is just beginning, with a very heavy crop. Very few early potatoes were planted. Market-garden crops are generally good, but not very early on account of cold rains. Pasturage was never in better condition. Strawberries are not up to the average, but currants are heavy. The heavy rains have nearly ruined crops on low lands. Much sunshine and warm weather are needed.

Stoneham (J. E. Wiley). — Canker worms are doing some damage. Acreage of Indian corn greater, but crop backward. Haying has not yet begun, but the prospect is very fine. Acreage of early potatoes about as usual and promise for the crop very good. Yield of early market-garden crops about as usual, but prices one-fourth lower. Not much change in the quantity and price of dairy products. Strawberries are a good crop.

Newton (Otis Pettee). — Canker worms and currant worms are still working and cut worms are more plenty than usual. Haying is just commencing, with a heavy crop. Owing to the cold and wet season considerable seed rotted in the ground, but late planting promises better results with market-garden crops. Quantity and price of dairy products not materially different from other years. Pasturage is in very good condition. Strawberries and

currants are prolific; blackberries have a full bloom and promise a fair yield.

Framingham (H. S. Whittemore). — Striped squash bugs and canker worms are doing some damage. Indian corn came up poorly and is very backward; acreage about as usual. Very little haying done as yet, with the prospect of a large crop. Acreage of early potatoes about as usual, with a full crop promised. Market-garden crops are backward and prices low. Dairy products average in quantity and price. Pasturage never better at this season. Apples about one-third crop, pears a full crop, peaches a small crop, strawberries a full crop and cherries a full crop in some places, but injured by the cold wet weather. Melons and cucumbers are very backward.

Marlborough (E. D. Howe). — Potato beetles, currant worms and the curculio are all doing some damage. Indian corn is in poor shape; acreage about as usual. Haying just begun, with a very large crop. Acreage of early potatoes about the same as usual, with the promise of a good crop. Yield of early market-garden crops all right, but prices very low. There has been an oversupply of milk, but cows are as high in price as ever. Pasturage is in excellent condition. Strawberries a fair crop, currants a full crop and raspberries a fair crop.

ESSEX COUNTY.

Salisbury (Wesley Pettengill). — Tent caterpillars have done some damage. Corn is looking badly, owing to cold wet weather; acreage decreased. Haying has not yet begun, but the prospect is for a large crop. Acreage of potatoes about as last year, but not as many early ones; crop looking well. Milk and butter are very plenty, with prices about as last year. Pastures never looked better. All berries are looking finely and there promises to be a large crop of pears and peaches. The month has been very cold and wet and all planted crops look miserably.

Haverhill (Eben Webster). — Tent caterpillars, canker worms and striped squash bugs have proved troublesome. Acreage of Indian corn about as usual, but crop backward, owing to wet weather. Haying has not begun and the prospect is about average. Potatoes promise fairly, with about the usual acreage. The prospect for market-garden crops is not quite as good as usual, owing to too much rain. Milk is plenty and price about as usual. Pasturage is in good condition. Currants were damaged by wet weather and worms, and strawberries were not quite up to the average.

Groveland (Abel Stickney). — Potato beetles are plenty and white grubs and wire worms are troublesome. The acreage of early potatoes is not average, but the prospect for the crop is quite good. Market-garden crops are backward. Dairy products high in quantity but prices low; dairy cows not high in price. Pasturage is in more than average condition. With the exception of apples the outlook for fruits and berries is fairly good.

Andover (M. H. Gould). — Canker worms and cut worms have proved troublesome. Indian corn is very backward, but the acreage is larger than usual. A few have begun cutting grass and a heavy crop is expected. Acreage of early potatoes smaller than usual and crop looking very well. Yield of early market-garden crops not as large as usual, prices about the same; prospect for later ones fair. There is a surplus of milk and the price is consequently lower. Pasturage is in very good condition. Strawberries promise a good crop and wild berries are looking remarkably well.

Hamilton (Alvin Smith). — Insects not doing much damage. Corn is looking very slim and about the same acreage has been planted. No hay cut yet, but the crop looks very good. Some pieces of potatoes are looking finely and there is about the usual acreage. The prospect for market-garden crops is very good. The quantity and price of dairy products are about the same as in former years. Pastures are looking finely. Strawberries are a very good crop.

Wenham (N. P. Perkins). — Onion maggots, squash bugs, plant lice and cut worms are doing some damage. Corn is backward and came up poorly, some fields having to be replanted several times; acreage decreased. Haying has not commenced, but the crop promises to be large though not of extra quality. Acreage of early potatoes about as usual, but the crop does not promise as well. Peas promise well, but will be late; asparagus sold fairly well, but the crop was small. Milk has been plenty, but good cows are scarce and high. Pastures are looking well, but the grass is not as good as usual. The prospect is good for strawberries, but other berries do not promise average crops.

NORFOLK COUNTY.

Randolph (R. A. Thayer). — Canker worms, potato beetles and cut worms are proving injurious. An average amount of corn has been planted, with growth uneven and very small for the season. Very little hay cut as yet; crop good, but lodged on low ground. Usual acreage of early potatoes planted, with the prospect of a good crop. Early garden crops have done well and brought fair

prices. Milk is very plenty, and cows are plenty with prices from $5 to $10 less than last year. Pastures are in fine condition. Strawberries promise a good crop.

Medfield (G. R. Chase). — Canker worms have done some damage. Acreage of Indian corn about as usual, but crop rather backward. Haying has hardly begun and the crop is not more than 80 per cent of an average in feeding value. The acreage of early potatoes is larger than usual, but the prospect for the crop is poor. Early market-garden crops are below average in yield, price and quality. Quantity of dairy products large and price low; dairy cows have no value in this vicinity. Pasturage was never in better condition. Strawberries made a large yield, with quick sales at remunerative prices.

Millis (E. F. Richardson). — Canker worms, potato beetles and spittle insects are doing some damage. Corn is three weeks late, uneven and poor, with less than the usual acreage. Haying has just commenced. The acreage of early potatoes is rather increased and a large crop is promised. Market-garden crops are fairly good but prices are low. Dairy products and cows are low in price. Pasturage is in better condition than ever before. Strawberries and blackberries promise big crops.

Medway (M. Morse). — Cut worms have done some damage. Indian corn is very backward and the acreage rather less than usual. Haying is just beginning and there is prospect of a heavy crop. Acreage of early potatoes and promise for the crop both a good average. Pasturage is very good indeed. Peaches, plums and small fruits promise well, but apples poorly.

Bellingham (J. J. O'Sullivan). — Tent caterpillars have proved injurious. Corn is not very good color, owing to wet weather; acreage about as usual. Haying has not yet begun, but the prospect is very good. The acreage of early potatoes is larger than usual and they promise well. Market-garden crops about as usual in yield and price. Quantity and price of dairy products a little lower; supply and price of dairy cows about the same. Pasturage is in very good condition. Apples will be a small crop, pears poor, strawberries very good.

Wrentham (Thomas Breen). — Currant worms and rose bugs are doing some damage. Indian corn is backward and requires more warm weather. Haying has not begun, but the prospect for the crop is very good. Acreage of early potatoes about as usual and they promise very well. The prospect for market-garden crops is good though they are later than usual. The price of dairy products is about as usual, but dairy cows are more in demand.

Pastures are in good condition. Strawberries are good, currants poor, pears good and apples about half a crop.

BRISTOL COUNTY.

Easton (H. M. Thompson). — Indian corn is looking well and there is a slight increase over the usual acreage. Haying has begun and a heavy crop is expected. The average acreage of early potatoes has been put in and they are looking well. No change in the yield and price of early market-garden crops from former years. Prices for dairy products have not been wholly satisfactory; supply and price of dairy cows about as usual. The apple crop will not be large; pears seem to promise well; strawberries have suffered from the wet weather and many have rotted.

Mansfield (Wm. C. Winter). — Currant worms and potato bugs are doing some damage. Acreage of Indian corn about as usual; crop late and looking poorly, but has improved much of late. Little haying done, but prospects excellent for a full crop. Acreage of early potatoes about as usual and in average condition. Yield of early market-garden crops probably better than usual, with prices about the same. Price of cows about as usual; quantity of dairy products about average and prices low. Pasturage is in excellent condition. Strawberries a fair crop, currants a full crop, pears excellent, apples fair.

Berkeley (R. H. Babbitt). — Canker worms, tent caterpillars and cut worms are doing some damage. Corn is backward on account of cold, wet weather; acreage below the average. Haying just begun, with the prospect of a fine crop. About an average acreage of early potatoes and the early planted are looking finely. Not much change in yield of market-garden crops, but prices are very low. Prices of dairy cows and products do not differ much from last year. Pastures are in very good condition. Strawberries are a partial failure on account of wet weather; raspberries, currants and blackberries promise well.

Somerset (Joseph Gibbs). — Caterpillars, potato bugs and squash bugs are doing some damage. Corn is very backward. A few are cutting clover and the hay crop will be good. Acreage of early potatoes about as usual and prospect good. Early market-garden crops made an average yield, but prices are low. Quantity of dairy products about average and price about as usual; prices of dairy cows very high. Pasturage is in excellent condition. Strawberries are not more than half a crop, peaches fair, apples light and pears a full crop.

Westport (A. S. Sherman). — Canker worms and onion maggots are doing some damage. Indian corn is not looking well; acreage about as usual. A few have begun haying and the prospect is good for a large crop. Acreage of early potatoes not as large as usual, but crop looking well. There is always a demand for good cows and the prices this year are rather above the average of former years. Pastures never were in better condition. Strawberries and small fruits promise a good yield; pears plenty; apples rather scarce; some peaches and cherries.

Acushnet (M. S. Douglas). — Asparagus beetles, cut worms and potato bugs are doing some damage. As a general thing corn is not looking well and there is very little planted. Haying has begun and there will be one of the largest crops ever known here. Acreage of early potatoes full and they are looking well. Yield of early market-garden crops good, prices low and prospect for later ones good. Pasturage is in excellent condition. There is a large crop of strawberries and a fair one of raspberries, while peaches are looking well.

PLYMOUTH COUNTY.

Hingham (Aaron Low). — Squash bugs and cut worms are doing some damage. Indian corn is very poor and backward; acreage about as usual. There will be an immense crop of hay. About the usual acreage of early potatoes and the crop promises exceedingly well. Peas are looking well, but beans and sweet corn are very poor. Pastures are in excellent condition. Strawberries good; pears, plums and peaches promise well; apples light. Various market-garden crops have had to be replanted and are slow of growth on account of bad weather.

Brockton (Davis Copeland). — Cabbage maggots, squash bugs and potato bugs are doing some damage. Acreage of Indian corn about as usual; growth small, as nights are too cool for it. Haying has commenced, with prospects of a good crop. The acreage of early potatoes is about three-fourths of the normal; prospect for the crop quite good. Yield of early market-garden crops about an average and prices low. Quantity of dairy products full and prices low; good dairy cows as high as ever. Pasturage is quite good. Strawberries are a fairly good crop.

Bridgewater (Rowland Cass). — Cut worms and striped squash bugs are doing some damage. Corn is late but the acreage is slightly increased. Haying has begun and the prospect is for a heavy crop. Not as many early potatoes planted as usual, but they

give promise of an extra large crop. Yield of early market-garden crops about as usual, prices lower and prospect for those not harvested very good. Quantity of dairy products larger than usual, prices lower; enough dairy cows for the demand, with lower prices. Pasturage is in very good condition. Apples are poor and strawberries a good crop.

Halifax (G. W. Hayward). — Onion maggots, cut worms and potato bugs are doing some damage. Corn looks miserably; acreage about the same as last year. Not much haying has been done, but the grass crop is heavy. Potatoes are looking excellently at present and the full average acreage has been planted. Prices for dairy products are lower than ever before and the same is true of dairy cows. Pasturage is in good condition. Strawberries are a good crop but sales are slow.

Duxbury (A. M. Goulding). — We have been very free from insects so far this year. Corn is backward and the acreage is about as usual. Haying is well under way and the crop is considerably above an average. Acreage of early potatoes about as usual and crop looking fairly well. Yield and prices of early market-garden crops much the same as last year. No variation is noticeable in the quantity and price of dairy products for the last two or three years. Pastures are in good condition. Strawberries have done well.

Mattapoisett (A. R. Swift). — Currant worms and potato bugs are plenty and on some apple orchards plant lice have appeared. Indian corn is in fair condition considering the season; acreage less than usual. Haying begun on light lands with a good crop. The acreage of early potatoes is somewhat less than usual. Dairy products are about the same in quantity and price as last year. Pasturage is in good condition. The season will be short for strawberries, owing to the cold wet weather; currants good; blackberries and raspberries have set well.

BARNSTABLE COUNTY.

Sandwich (J. R. Holway). — Maggots and cut worms are doing some damage. Indian corn is not up to the average in condition and the acreage is small. Haying has begun; crop good on new seeding, old meadows small. About the usual acreage of early market-garden crops planted and looking fairly well. Cows command high prices. Pasturage is in average condition. The outlook for cranberries is promising.

Mashpee (W. F. Hammond). — Fire worms, cut worms, onion

maggots and potato bugs are doing some damage. Corn is looking very well and about average in acreage. Haying has not begun, but the prospect for the crop is very good. Acreage of early potatoes about average and a good crop promised. Yield of early market-garden crops below average so far, but it looks as if the price might make up the shortage. The quantity and price of dairy products is about average. Pasturage is in good condition. Apples, pears and peaches are below average; strawberries, raspberries and cherries are looking well.

Dennis (Joshua Crowell). — Cut worms and cranberry vine worms are doing some damage. Acreage of Indian corn less than usual and crop backward. Haying has just begun and the prospect is above the average. About the usual acreage of early potatoes, but they did not come up well and are uneven and backward. Market-garden crops are backward. Quantity and price of dairy products about as last year. Pasturage is in very good condition. Strawberries good, apples very few; cranberries, too early to predict.

Orleans (John Kenrick). — No insects are especially injurious. Indian corn is very short and backward; acreage small. Haying has not begun, but the prospect is good for a large crop. Acreage of early potatoes about as last year; vines look well and the prospect is good. The crop of asparagus has not been as heavy as usual, but prices have been better. Market of dairy products limited; supply and price of dairy cows much as usual. Pastures are in very good condition. Strawberries are a very good crop.

Truro (D. E. Paine). — Cut worms, potato beetles and maggots are doing some damage. No Indian corn planted of any account. Haying has begun and the prospect for the crop is fair. The acreage of early potatoes is about as in previous years and the promise for the crop is fairly good. Market-garden crops are very backward and it is hard to tell at present how they will turn out. Quantity and price of dairy products about as usual. Prospect for blueberries good and strawberries just commencing to ripen.

Barnstable (John Bursley). — Fire worms and white grubs are proving injurious. The acreage of Indian corn is average, but the growth is very small indeed. Orchard grass has been cut and the crop is one-fourth better than in 1896. The acreage of early potatoes is average and they are looking well. Quantity of dairy products a full average and prices lower; good dairy cows are scarce. Pasturage is in from fair to good condition. Strawberries are a smaller crop than last year. Cranberries are flowering well, but insects are troublesome.

DUKES COUNTY.

West Tisbury (Geo. Hunt Luce). — Indian corn is looking much better than could be expected considering the cold weather; acreage not so great as usual. People who are troubled by "white weed" in their grass have begun haying; prospect for the crop promising. Early potatoes have about the usual acreage, but are not as early as usual. Dairy products are much lower in price than formerly. Pasturage is in better than average condition. Strawberries are doing well although some lost their vines by the white grub last fall.

NANTUCKET COUNTY.

Nantucket (C. W. Gardner). — Potato bugs and striped squash bugs are doing some damage. Corn is very backward, but the acreage is about the same as usual. Haying has begun in some places and the crop is heavy as a general thing. The acreage of early potatoes is about the same as in former years, but the seed has rotted badly in the ground. Market-garden crops made a very good yield, but prices are so low that they will not pay for the labor. Prices of dairy products are so low that butter will not pay at all. Pastures were never in better condition. Strawberries look well, but are slow in ripening, and white grubs are destroying many beds.

BULLETIN OF

MASSACHUSETTS BOARD OF AGRICULTURE.

THREE SHADE-TREE INSECTS.

By A. H. Kirkland, M.S., *Assistant Entomologist.*

The Sugar Maple Borer.*

One of the largest and most gaily colored beetles of our New England fauna is responsible for injuries of a most serious character to the sugar maple, a tree which, from beauty of form and as a source of sugar, justly holds a high place in popular estimation. The damage resulting from this beetle, commonly known as the sugar maple borer, shows itself in gnarled and distorted trunks, dying branches and, too frequently, in the gradual death of the entire tree. This pest is not a new one to this region, although its ravages appear to be most severe in more northern latitudes. The habits of the insect were first noticed and described by a New Hampshire pastor, the Rev. L. W. Leonard, who is quoted by Dr. Harris in his "Insects Injurious to Vegetation." The latter author gives an excellent description of the mature beetle. Other writers have given many interesting notes upon the habits of the insect, but perhaps the best account of the life history of this borer is that by Prof. A. S. Packard, in the fifth report of the U. S. Entomological Commission. From this article, as well as from the writings of Saunders, Bethune, Weed and others, the writer has drawn liberally in the preparation of this paper.

Life History.

The eggs are laid by the mature beetle on the trunks of sugar maples during the months of July and August. According to Packard, the beetle cuts obscure gashes in the bark and in them

* *Plagionotus speciosus* Say.

deposits the eggs. The eggs hatch in a short time and give rise to small white grubs, which "mine" the bark for a short distance before attacking the cambium layer of the tree. Soon, however, they burrow to the living wood and commence their work of destruction. Many borers feed only upon dead wood, but this insect apparently feeds only upon living wood. The burrows or grooves cut by the larvæ generally run upward, beneath the bark and partially around the tree, although it is not rare to find them running almost directly downward. These grooves follow very irregular lines, are about one-half inch in width by perhaps one-third inch in depth, and, by passing around a part of the tree, cut off the sap circulation in that part. Where the larvæ are abundant it is not an uncommon thing to find a tree entirely girdled by these grooves.

FIG. 1. The Maple Borer. (From Saunders.)

It seems probable that two years are required for the completion of the transformations of this insect. In examining a number of infested trees I have found several burrows entering the wood for an inch or two, half way in their course, then coming out to the cambium again and continuing to enlarge until the place for pupation is reached. From this it might appear that the larva is only partly grown when overtaken by winter and seeks shelter in the trunk at this time, as well as when preparing to pupate. In a recent letter Dr. A. S. Packard expresses the opinion that two years are required for the development of this insect.

FIG. 2. Trunk of a Maple attacked by the Maple Borer. (Original.)

When the larva approaches maturity it usually enters the trunk for a short distance and forms a chamber, within which it transforms to a pupa, from which, in midsummer, the mature beetle emerges. Under burlap bands placed on trees at Malden, Mass., to collect gypsy moth larvæ, I have found the mature beetles as early as June 24. The majority of the beetles, however, do not appear until July, during which month they may be occasionally found on the blossoms of goldenrods.

Dr. Harris describes the mature beetle as follows: "The beetle is black, with a yellow head, with the antennæ and the eyes reddish-black; the thorax is black, with two transverse yellow spots on each side; the wing-covers for about two-thirds of

their length are black, the remaining third is yellow, and they are ornamented with bands and spots arranged in the following manner: a yellow spot on each shoulder, a broad yellow curved band or arch, of which the yellow scutel forms the keystone, on the base of the wing-covers; behind this a zigzag yellow band forming the letter W, across the middle another yellow band arching backwards, and on the yellow tip a black curved band and spot; legs yellow, while the under side of the body is reddish-yellow, variegated with brown, nearly an inch in length."

Nature of the Damage.

The cambium layer, the layer of living wood just beneath the bark, is the growing part of the tree and contains vessels which serve a function similar to that of the arteries and veins of an animal. The grubs or larvæ of the borer feed in the cambium and cut off the circulation of sap. This results in the death of the trunk near the burrows, the bark falls off and areas of dead wood are exposed to the disintegrating influences of the air. In the meantime, however, the tree attempts to overcome the injury by throwing out an additional growth at the wounded places, and thus the gnarled and unsightly trunks are produced. An early yellowing and falling of the foliage is another indication of the presence of the borer and betrays the weakened condition of the tree. The largest or so-called "first growth" maples are nearly exempt from the attacks of this insect, possibly because the roughness and thickness of the bark may prevent the beetle from depositing its eggs. Younger trees, with smoother bark, are frequently attacked, and upon such trees throughout the State the ravages of the beetle are apparently on the increase.

Natural Enemies.

As natural enemies of this insect it is probable that various species of woodpeckers render the greatest service. At Huntington, Mass., I have seen the hairy woodpecker, the downy woodpecker and the flicker feeding upon white larvæ taken from beneath the bark of maples infested by this borer, — presumptive evidence that these birds feed upon this insect.

Remedies.

The application of remedial treatment for borers is generally attended with considerable difficulty, since the insects cannot be reached by insecticides, and in the case of the maple borer, as with many allied beetles, hand labor is the best means for destroying the pest. An examination of the infested trees in September

will reveal small discolored spots on the trunks, showing where the larvæ have commenced feeding. Masses of fine brown castings are often found on these spots. By the use of a sharp knife the larvæ may be dug out and killed, while the burrows of the older larvæ should be followed and the inmates destroyed. All exposed wood, whether living or dead, should be thoroughly coated with a thick lead and oil paint, to exclude the air and prevent decay. Dead branches should be removed and the stumps painted. Where the trees are badly infested it may be advisable to prune severely, for with a limited and weakened sap circulation they cannot properly support the normal amount of foliage.

The preceding suggestions apply chiefly to the treatment of infested maples which serve as shade trees. In the case of an infested sugar orchard it would be impossible and impracticable to give the trees the same degree of care, and here the main dependence must be placed upon preventive measures. If one will take the trouble to look over a number of sugar orchards, he will find that the ones most affected by the borer are those in which the underbrush and smaller trees have been cut, and the writer would suggest that here we have an explanation of the increase of this pest in the sugar orchards of western Massachusetts. Brush and undergrowth in a sugar bush interfere with the gathering of sap at the season of sugar making, and the practice of "clearing up" sugar orchards is one growing in favor with the owners of the orchards. Where maples have grown with trees of other species, and with a thick forest cover, the trunks are usually free from branches to a considerable height. When the forest cover is suddenly cut off and only the maples are left standing these trees soon become weakened, as a result of the altered conditions. It is a well-recognized fact that sickly trees are the favorite victims of borers of all kinds, and the maple is no exception to this rule. The clearing up of sugar orchards also allows the sunlight to penetrate to a greater extent than before, and the borers, being sun-loving insects, doubtless find a greater number of attractive places in which to lay their eggs. During the past five or six years the writer has had several opportunities to examine the sugar orchards near his home at Huntington and in other parts of western Massachusetts, and has seen repeatedly the clearing up of orchards followed by extensive damage by this borer, and is led to believe the matter is simply one of cause and effect.

Remedial measures may be briefly summarized as follows: for infested shade trees, cut out the borers in September, prune if necessary, and cover all exposed wood with thick paint. In sugar orchards, allow as much forest cover as is consistent with the work

of sap gathering. In both cases cut all badly infested and dying trees and burn them before midsummer, thus destroying the insects they contain.

The Oak Pruner.*

From an entomological stand-point the summer of 1896 was marked by an unusual abundance of the oak pruner in eastern and central Massachusetts. The red oak suffered most severely, but the white and scarlet oaks were not wholly exempt from the ravages of this beetle, while in some cases the sugar and red maples and hickories were attacked either by this insect or by one of identical habits. The presence of the borer is shown by the falling of living branches which have been severed from the tree by a clean cut. By splitting the severed end of a fallen branch the insect causing the damage may be readily found, — a slender white or yellowish-white grub with black mouth parts.

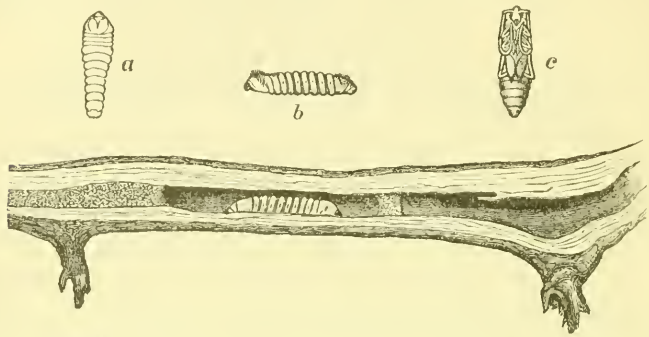

Fig. 3. The Oak Pruner. *a*, larva; *b*, side view of same; *c*, pupa. (From Packard.)

Life History.

The eggs are said to be laid by the parent beetle in early summer upon the young growing lateral twigs, at a distance varying from a few inches to a foot or more from the main branch. Probably but a single egg is laid on each lateral twig. Upon the hatching of the egg the young grub or larva burrows downward in the twig, leaving but a thin shell of bark and wood. When the branch is reached a burrow is made beneath the bark for a short distance toward the trunk, and the branch is nearly cut off by the larva. The latter then retreats into its burrow, plugs it with chips and feeds within the branch. Winds soon break the weakened branch from the tree, and in the fallen branches the larvæ feed until fall, when the majority transform into pupæ from which the mature beetles emerge the following spring.

Fig. 4. Oak Pruner.†

* *Elaphidion villosum* Fabr. † Drawn by J. H. Emerton.

Concerning the time occupied by this borer in passing through its various transformations there are many statements of a contradictory character. It would appear that the time may vary from one to four years, although the writer believes that one year is the rule in this region. Dr. Hamilton,* in his criticism of the writings of Peck, Harris and Fitch on this insect, states that in cases coming under his observation from three to four years were required for the development of the mature insect. In the summer of 1896 a number of branches infested by this insect, collected soon after falling from the trees, were placed in an outdoor breeding cage at the insectary of the gypsy moth committee, Malden, Mass. From these branches, at the time of writing (June 12, 1897), the mature beetles are emerging, thus showing that the round of life may be completed in a single year and corroborating the statements of Fitch and other early writers concerning this point.†

Natural Enemies.

As natural enemies of the oak pruner Mr. F. H. Mosher records the downy wood-pecker, the blue jay and the chickadee. I have found a spider, determined by Mr. J. H. Emerton as *Theridium tepidariorum* C. Koch, feeding upon the mature insects.

Remedy.

Preventive measures are the only ones of value in combating this insect. The fallen branches should be gathered and burned at once, thus destroying the borers which otherwise might transform and appear as beetles the following year. A common mistake made by many property owners is that of gathering the infested branches and leaving them on some convenient rubbish heap. This procedure is worse than useless, since under such conditions the transformations of the borer are not hindered.

The Imported Elm Bark Louse.‡

In cities and suburban districts the damage to young elms by this insect is a frequent and increasing cause of complaint, and while its life history has been so well treated by Lounsbury in Bulletin 28, Massachusetts Hatch Experiment Station, a brief statement concerning its habits and the remedies we have found effective in destroying it may be properly given at this time.

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* Canadian Entomologist, August, 1887.

† Statements also vary concerning the time of the appearance of the mature beetles. In 1896 the majority of the beetles captured at Malden were taken in June. Mr. A. F. Burgess has taken specimens of this borer as early as April 11.

‡ *Gossyparia ulmi* Geoff.

This insect is an imported bark louse, superficially resembling the "mealy bug," and is commonly noticed in the crevices of the bark on the trunks and branches of elms. The females are bordered with a mass of whitish wax and give birth to large numbers of young during the early part of July. The young lice migrate to the leaves and after feeding on the plant juices throughout the summer, return to the branches with the approach of cold weather and prepare to hibernate. According to Prof. L. O. Howard, the males appear late in May and the females give birth to the young in from three to four weeks from the time of pairing.

Food Plants and Damage.

This bark louse was probably brought to this country upon European elms. It occurs commonly on the Camperdown and Scotch elms and also inflicts serious injury to the American elm, the slip-

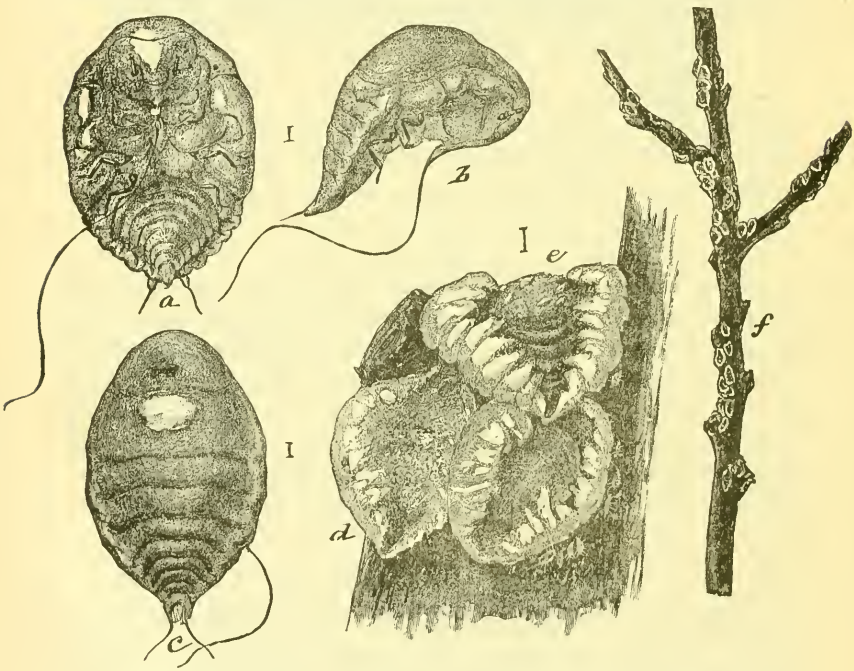

Fig. 5. The Elm Bark Louse. *a*, adult female from below; *b*, adult female from side; *c*, adult female from above — all greatly enlarged; *d*, empty wax cushion; *e*, females in natural position — enlarged; *f*, shrivelled females, natural size. (From "Insect Life.")

pery elm and the cork elm. The greatest damage to elms from this insect occurs on young trees recently taken from the nursery. As factors in the dissemination of this insect, nurseries have played a most important part. In fact, the first complaint of damage from the elm bark louse was reported from a large nursery in New York. Where large numbers of elms are grown in compact plots

the insect appears to find most favorable conditions for multiplication, and it is a matter of the writer's personal observation that many of the large nurseries in this State where elms are thus grown are abundantly supplied with the insect. The elm bark louse is now generally distributed throughout Massachusetts, and may be considered a serious pest, since from the insidious nature of its attack it often escapes notice until the infested trees are injured beyond recovery. The presence of the insect is often indicated by an early yellowing of the foliage on the infested branches and the gradual death of the latter from the tip downward toward the trunk.

Remedies.

The damage from the imported elm bark louse is a long time in appearing and considerable time is required for the tree to recuperate from the injury. Badly infested trees should be pruned of all dead and dying branches in the fall, the wounds being covered with thick oil paint or gas tar. At the same time the trunk and branches should be scrubbed with strong kerosene emulsion, made by dissolving one-half pound hard soap in two quarts of hot water and stirring into the mixture while hot one gallon of kerosene oil. Dilute the emulsion with three parts of water and scrub the trunks and branches with this mixture, using a stiff brush. The following spring, top-dress the ground beneath the trees with good stable manure or with nitrate of soda and later, in July, spray the foliage thoroughly with kerosene emulsion, diluted one part to nine of water. The recommendations given above apply to cases where the trees have been seriously injured. Where the insects occur in moderate numbers, both the scrubbing and spraying may be done in July with satisfactory results. Often a thorough spraying at this time will suffice to destroy the greater part of the insects.

To show how cheaply this work may be done where a large number of trees are to be treated, the following account of the treatment of 3,000 young elms in Manning's nursery at Reading, Mass., may be of interest: In May, 1896, Mr. Manning found that the elm bark louse had multiplied to such an extent as to seriously infest a large part of his stock of elms. At the writer's suggestion, these elms were scrubbed with strong kerosene emulsion and in July were thoroughly sprayed with the dilute emulsion. The cost of the work, taken from data kindly furnished by Mr. Manning, was as follows: Labor, $18; kerosene and soap, $3; a total expense of $21, or 7 mills per tree. As a result of this treatment over ninety per cent of the insects have been destroyed; in fact it would now be difficult to find a more thrifty lot of elms. This shows the comparative inexpensiveness of the remedy and the good results attending its thorough application.

SERIES OF 1897. BULLETIN NO. 3.

MASSACHUSETTS

CROP REPORT

FOR THE

MONTH OF JULY, 1897.

ISSUED BY

WM. R. SESSIONS,

SECRETARY STATE BOARD OF AGRICULTURE.

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1897.

Crop Report for the Month of July, 1897.

Office of State Board of Agriculture,
Boston, Mass., Aug. 1, 1897.

Bulletin No. 3, Crop Report for the month of July, is herewith presented. Special attention is called to the article on "Why milk sours, and how the souring can be prevented or at least delayed," by Geo. M. Whitaker, A.M., acting executive officer of the Massachusetts Dairy Bureau, which is printed at the close of this bulletin.

Progress of the Season.

Report No. 150 (July, 1897) of the Statistician of the United States Department of Agriculture states that the consolidated returns on the acreage of Indian corn indicate a decrease of 1.2 per cent, or a decrease of about 1,000,000 acres, the estimated area under corn now standing at 80,095,051 acres. Only ten States show an increased area devoted to this crop as against thirty-four reporting a decrease. The average condition of corn is 82.9, or 9.5 points lower than in July of last year.

The condition of winter wheat is 81.2, or 2.7 points higher than last month, and 5.6 points higher than in July of last year. The condition of spring wheat is 91.2, or 1.6 points higher than last month, but 2.1 points lower than last year. The average condition of spring and winter wheat combined, 84.9, is 1.5 points higher than that of the corresponding period of last year. The percentage of the 1896 crop of wheat now on hand is 5.46.

The average condition of the oat crop, 87.5, is 8.8 points lower than in July of last year, but is only a small fraction of 1 per cent lower than the average July condition of the last ten years. Iowa, the leading oat-producing State of

the country, has an average of only 84, but other of the larger oat-producing States report high averages of condition.

The average condition of winter rye, 95, is 11.2 points higher than in July of last year, and also exceeds any July average since 1889. The average condition of spring rye, 90, is 8.6 points lower than the exceptionally high average of last year. The average of this crop is determined largely by that of Wisconsin, which produces about one-half the entire crop of the country. The average for spring and winter rye combined is 93.4.

The condition of barley is 88.5, or 0.4 points higher than at this time last year. The four States of principal production, — California, Minnesota, Iowa and Wisconsin, — all have high averages.

The consolidated returns in regard to Irish potatoes show an acreage of 91.6 per cent of that of 1896. This shrinkage is general, Nebraska being the only State with any considerable acreage devoted to this crop that shows an increase. The condition is reported as 87.8 against 99 in July of last year, the present condition being lower than the July condition for a long series of years.

Data are not sufficient to give an average for the condition of clover, but it is generally good, most of the North Atlantic States reporting one of the best crops for many years.

On the whole, the reports in regard to timothy are less satisfactory than those for clover, owing to a backward spring.

Pastures are generally good, and in a few States in prime condition.

The returns relative to the fleeces sheared in the fall of 1896 and the spring of 1897 make the average weight for the entire county 5.8 pounds, the highest for several years.

The average condition for cotton is 86 as compared with 83.5 for last month and 92.5 in July, 1896.

The acreage of tobacco shows a falling off of 21.5 per cent as compared with last year. In point of condition, also, the tobacco crop on July 1 compared very unfavorably with the condition at the corresponding period of last year, the averages being 78.5 and 91.5 respectively.

The Louisiana rice crop is reported as 95; that of South Carolina as 92, and that of Georgia as 98.

With few exceptions the reports on the peach crop are unfavorable, the only notable exceptions being Arkansas, Washington and Oregon.

Apples are also far below the average, except in the far West and on the Pacific coast. From all the North Atlantic States the reports are more or less unfavorable.

California reports the grape crop as promising to be exceedingly good. Reports from other States range from poor to very satisfactory, with the general promise of a good crop in most of the important States.

In Massachusetts the acreage of corn compared with last year is 92 and the average condition July 1 is 80; the average condition of spring rye 98; the average condition of oats 96; the average condition of barley 95; the acreage of potatoes 94 and the average condition 92; the average condition of beans 88; the acreage of tobacco 105 and the average condition 98; the average weight of wool per fleece 5.5 pounds; the average condition of clover 106; the average condition of timothy 105; the average condition of pasturage 104; the average condition of apples 56; and the average condition of grapes 100.

Temperature and Rainfall for the Whole Country.

Week ending June 28. — The week was warmer than usual in the Southern States and slightly warmer over portions of the north Pacific coast. Throughout the northern portions of the country east of the Rocky Mountains, over the central and southern plateau regions and the greater part of California the week was cooler than usual. The minimum temperatures of the week were, at some stations, lower than any previously recorded for the third decade of June. Except over limited areas, where the rainfall was excessive, the week was generally dryer than usual from the lake region and New England southward to the Gulf coast. Over nearly the whole of New England and the lake region there was an entire absence of rain. Over the upper Mississippi and Missouri valleys and westward to the north Pacific coast the

rainfall exceeded the average. The week was, upon the whole, favorable to plant growth. Corn made improvement in the principal corn States. Winter wheat harvest continued under generally favorable conditions and spring wheat generally made favorable progress.

Week ending July 5. — The week was warmer than usual in the central and north Pacific coast regions and in all districts east of the Rocky Mountains, with the exception of northern New England, where it was cooler than usual. Throughout the Rocky Mountain and plateau regions the week was cooler than usual, it being decidedly cool in the central plateau districts. More than the average amount of rain fell in the lower Missouri valley, over the southern portions of the upper Mississippi valley, in the upper Ohio valley, portions of the lower lake region, Middle Atlantic States and southern New England, and over limited areas in other parts of the country. Elsewhere the week was dryer than usual. In the States of the central valleys, the lake region and New England the week was very favorable to crops. The bulk of the winter wheat crop was harvested and spring wheat continued to make good progress. Tobacco continued to improve generally.

Week ending July 12. — The week was warmer than usual over the greater part of California and in all districts east of the Rocky Mountain slope, with the exception of limited areas on the northern New England and south Atlantic coasts, where it was slightly cooler than usual. Throughout the plateau districts and eastern Rocky Mountain slope and over the north Pacific coast the week was cooler than usual. The week was generally dry in the Middle Atlantic States and New England, the greater part of the lake region and the greater part of the central valleys. On the south Atlantic coast, in eastern and southern Florida, and from southern Mississippi and western Alabama northward over central Tennessee and the Ohio valley the rainfall was excessive. There was also more than the average rainfall in Minnesota and over portions of other central and western States. Crops made good progress except in some southwestern States where drought prevails. Corn made rapid growth in the central valleys and the lake region. Tobacco did well except

in Kentucky, Tennessee and Maryland, where it suffered from drought.

Week ending July 19. — The week was slightly warmer than usual in southwestern and central regions, New England, and the northern portions of the North Atlantic States. Over the greater portion of the country the week was cooler than usual, the deficiency being greatest in the States of the central valleys. The week was dryer than usual in the Mississippi, lower Missouri, and lower Ohio valleys, and over portions of the lake region, gulf and South Atlantic States. Heavy rains fell in New England, over the greater portion of the Middle Atlantic States, the eastern portion of Tennessee and Kentucky, and over portions of other southern and central States. The rainfall from southern New Jersey to northern New England was exceptionally heavy, from 4 to 9 inches being reported. Some damage resulted to crops from excessive rains in New England and the Middle Atlantic States. Corn made favorable progress in the principal corn States. Winter wheat harvest is generally completed and spring wheat has been harvested in Nebraska. Tobacco made general improvement, except in Kentucky.

Week ending July 26. — The week was cooler than usual in the upper Missouri valley, throughout the Rocky Mountain and plateau regions and on the Pacific coast. There was a very slight deficiency on the northern New England coast, and nearly normal temperature conditions prevailed on the Gulf, middle Atlantic and southern New England coasts, and over portions of Georgia, the Carolinas and Virginia. Elsewhere throughout the country the week was warmer than usual. The week was characterized by unusually heavy rainfalls in southern New England, over portions of the Middle Atlantic States and in the Ohio, upper Mississippi and Red River of the North valleys. The week was dryer than usual over the Florida peninsula, and from the west Gulf coast northward, also over limited areas in the North Central States. Practically no rain fell on the Pacific coast. Corn continued to make rapid growth in the States of the central valleys. Cotton generally made favorable progress. The week was not favorable for completing the winter wheat harvest in northern districts. The general outlook for tobacco is encouraging.

Special Telegraphic Reports.

[Weather Bureau, Boston.]

Week ending June 28. — New England. Boston: General situation improved by several warm, sunny days, and less rain; haying well under way in south and started in north; corn still backward; early oats heading in south; rye and wheat filling well.

Week ending July 5. — New England. Boston: Week generally warm and favorable; corn improved perceptibly; haying progressing; potatoes light crop in Maine, fair elsewhere; tobacco all set with good standing, but uneven; large showing of peaches in the south.

Week ending July 12. — New England. Boston: Intense heat and bright sunshine produced rapid and healthy growth; heavy local showers in north and west on 6th and 7th, no extensive damage; corn and tobacco growing fast; hay crop heavy; rye and oats being harvested in extreme south.

Week ending July 19. — New England. Boston: High winds and tremendous rains on 13th and 14th prostrated crops over large part of district, actual precipitation 6 to 9 inches in many localities; grass greatly damaged, and hay on lowlands washed away by floods; oats and rye badly lodged; corn little damaged; fine growing weather last week, and cultivated crops making quick recovery.

Week ending July 26. — New England. Boston: Generally unfavorable week owing to frequent rains with severe local storms; practically no harvesting; oats, rye and potatoes damaged; hay crop seriously injured by rains; second growth of grass good; corn making rank growth.

Weather for July, 1897.

This month has been characterized by meteorological features which will cause it to be long remembered. The excessive heat during the first decade, the abnormally heavy rains of the 13th and 14th, unequalled for many years, the occurrence of severe local storms, and the spell of gloomy and unseasonably cool weather at the close of the month constituted a chain of conditions which illustrate the variability of New England climate.

The month began with temperature at the seasonal average, and this, in connection with the beneficial rains at the close of June, gave first-class growing conditions. A heated spell set in on the 5th and continued without interruption until the 10th. During this period maximum temperatures of 90° and over were commonly registered, and under the influence of the intense heat and bright sunshine, with but little rainfall, all crops advanced rapidly and healthfully. The warm spell was terminated, temporarily, on the 10th by a so-called "sea-turn" on the coast, and which was generally felt throughout the State. From the 12th to the 25th there was the usual number of days of summer warmth, but no extreme heat, although many days were extremely trying, owing to moist, south winds. A season of damp, east winds, beginning with the 25th and lasting through the 29th, gave very cool temperatures, averaging a daily departure below the normal of 8°, so that the month closed with small accumulated excess in temperature, notwithstanding the hot weather at its commencement.

The precipitation record was a remarkable one, and easily takes front rank as the most important characteristic of the month. The first five days witnessed but little rainfall, generally speaking, except that on the 2d a heavy local storm, accompanied by hail, visited portions of Worcester County. At East Templeton the storm was reported to be the heaviest for a number of years, and much damage was caused locally by it.

Heavy thunder showers traversed the western part of the State on the 7th, washing roads and beating down crops, but on the whole the rain was a benefit. From that date up to the time of the great storm of the 13th–14th, generally fair weather prevailed. This last-named storm was of an exceptionally violent character, in fact almost unprecedented at this season of year. It came from the western States, moved across the lake regions on the 12th, and became central in western Massachusetts on the morning of the 13th. Its centre remained nearly stationary through the 13th and 14th, owing to the obstructing area of high barometer in the north-east, and during these two days torrents of water were poured over all the State except the extreme eastern and

south-eastern parts. The actual precipitation in interior and western Massachusetts was from 5 to 8 inches, some of the amounts officially reported being as follows: New Salem, 8.01 inches; Leeds, 6.39; Winchendon, 6.00; Fitchburg, 4.94. At Concord the fall was but 1.07; at Boston little more than one-fourth inch fell, and in the Cape Cod district the rain was also light. The gale which attended the storm was of great violence. The wind attained a velocity of fifty miles at Boston on the morning of the 14th, and for one minute it blew at the rate of sixty miles per hour. The resulting damage by the storm was large, although it is probable that most of the direct money loss can be charged to bridges, highways, etc., rather than to crops. The latter were damaged rather less than might have been expected, and nearly all growing crops, particularly corn and potatoes, righted themselves. Hay was the most seriously hurt of all crops, especially on meadows and intervales. The weather for several days immediately following the storm was all that could be desired and growing crops rapidly recovered.

The week ending with the 26th was, however, unfavorable. It was damp and unsettled, with hardly a single fine, clear day. Meadows and lowlands continued too wet for cultivation and much mown hay was caught by rains and spoiled. Heavy thunderstorms passed across the State on the 23d and 24th, damaging crops to some extent. At Fitchburg more than three inches of rain fell in a thunderstorm, and a general rain storm on the 22d gave large amounts of water.

The month was brought to a close with heavy rains on the 29th, when a coast storm was central off Nantucket.

It will be necessary to scan the records for many years back to find a parallel July, especially with reference to precipitation.

In the circular to correspondents returnable July 23, the following questions were asked: —

1. What insects are proving most troublesome in your locality?

2. What is the condition of Indian corn, and what proportion of the crop will be put into the silo?

3. What is the quantity and quality of the hay crop as compared with former years?

4. What forage crops are being raised to supplement the hay crop, for the silo, and to eke out the pastures, and what is their condition?

5. What is the condition of market-garden crops, including potatoes, and how have those already harvested compared in yield and price with former years?

6. What is the prospect for apples, pears, peaches, plums, quinces, grapes and cranberries?

7. What is the condition of pasturage in your locality?

8. How have rye, oats and barley compared with former years, both as grain and forage crops?

Returns were received from one hundred and eighty-seven correspondents, from which the following summary has been made: —

Insects.

The potato beetle is the insect most commonly spoken of as being troublesome, but in no section do its ravages appear to be particularly serious, and if anything it has been less plentiful than usual. The squash bugs, both the black and the striped varieties, appear to be rather more numerous than usual, but they cannot be said to be doing any remarkable amount of damage. Other insects reported are currant worms, cabbage worms, rose bugs, tent caterpillars, canker worms, plant lice, white grubs, cut worms, grasshoppers, the pear tree psylla, the coddling moth, the squash vine borer, corn worms, horn flies, the elm tree leaf beetle, the onion maggot and cranberry vine and fire worms. The opinion is prevalent that this is a particularly favorable year for insects, but this is not borne out by the reports of our correspondents. These lead us to the conclusion that insects, while fairly plentiful, are not on the whole as injurious as on average seasons.

Indian Corn.

Indian corn has been, and still is, very backward. The recent warm weather has, however, caused it to grow very fast, but it has also suffered of late from the excessive rains. The color is reported to be off and the stand uneven, this

latter due to so much seed rotting and replanting being necessary. It is difficult to forecast the result of this crop, as so much depends upon the weather. With warm, dry weather in August a good crop will yet be harvested, but if the rains continue results must be unfavorable. The stalks are at present very tender from rapid growth and excessive moisture, and in some sections the recent high winds did considerable damage to the crop. About the same amount will be put into the silo as in former years, though should any large portion of the crop fail to ripen this proportion may be materially increased.

The Hay Crop.

Reports from all quarters agree in saying that the hay crop is one of the largest ever known in the State. The quality is also said to be excellent as a rule, though trouble is reported in some sections from the presence of weeds which have thriven unduly during the wet weather. The rains have delayed haying so that at the time of making returns haying was not completed in most sections, and in fact in some was hardly begun. This delay has a tendency to cause over-ripeness, and grave fears are expressed that the quality of the crop will suffer severely from this cause. Then, too, a great deal of hay has been caught out and damaged by the heavy rains. The crop may therefore be summed up as a large yield, originally of good quality, but over-ripe in many cases and much damaged by rain.

Forage Crops.

As a heavy hay crop was assured from early in the season, and as pastures have also been in good condition, forage crops were somewhat less grown than usual. They are, however, generally in good condition. Fodder corn is the crop most extensively grown for this purpose, and oats, barley, Hungarian grass and millet follow in the order named. Other crops grown, though to a less extent, are rye, peas, oats and peas, vetches and peas, barley and peas, soja beans and wheat. We have been unable to definitely ascertain to what extent forage crops, other than corn, are used for the silo, but it would seem to be to a degree so small as to be hardly worth mentioning.

Market-garden Crops.

Market-garden crops have, like all other crops, suffered more or less from the severe rains, but aside from this they are in good condition and promise well. Prices have ruled about as usual, but if there has been any change it has been in an upward rather than a downward direction.

Early Potatoes.

It is hard to give any detailed statement in regard to this crop as returns vary widely. Not many had been dug at time of making returns and we must wait for later advices before making any more definite statement. On the whole, a fair crop was promised, good in some sections and poor in others. Considerable complaint was made of blight, due probably to the wet weather. Prices are generally spoken of as good, being much better than for several seasons past.

Fruits.

Apples will not be a full crop, but they promise well for an off year, particularly summer and fall varieties. Pears promise, on the whole, a good average crop. Peaches, as predicted last month, will yield better than for several years past though not a full crop. Quinces generally promise a full crop, as do also grapes. Cranberries have set well generally in the section of commercial production, though the crop is somewhat later than usual.

Pasturage.

Correspondents almost unanimously agree that pastures are in good condition, many stating that they have never been better at this time of year. This would appear to be one direction in which the excessive rains have not been detrimental.

Small Grains.

Rye, oats and barley are all good crops, if anything, a little above the average. Oats and barley are mostly grown for fodder, rye being the only one of these crops which is grown for grain to any extent. The condition of all three

crops is good, though there is considerable complaint of oats lodging.

The Weather.

The month has been more favorable to farm crops than was the earlier season so far as temperature was concerned, but the rains have been excessive, particularly in the western portions of the State, and many crops have suffered severely therefrom. On low lands standing water has drowned out crops in many places, and it is only on light land that crops have not suffered from excess of moisture. It is feared that the tobacco crop will be materially damaged. The gale of the 13th and 14th did some damage to fruit and field crops, but less than would naturally have been expected considering the velocity of the wind.

NOTES OF CORRESPONDENTS.

(Returned to us July 23.)

BERKSHIRE COUNTY.

Mount Washington (H. M. Weaver). — Potato bugs are doing some damage. Corn is looking well now; we have no silos. The hay crop is above the average in both quantity and quality. Fodder corn is the only forage crop and is looking well. Pears, plums and cranberries promise well. Pasturage is in exceedingly good condition. Rye is a better crop than usual, but oats are about the same.

Alford (L. T. Osborne). — Corn is backward on account of wet weather and is looking very badly; perhaps one-third of the crop will go into the silo. Hay is a much better crop than for some years, but much of it will be cut too late. Potatoes promise to be a fair crop, but excessive moisture is doing them much damage. Apples will be half a crop and pears a full crop. Pastures are in the best condition. Rye is a light crop, but oats and barley are above the average.

Tyringham (G. F. Kopp). — Potato bugs are doing some damage. Corn is late, but is doing well now. Hay is extra good, better than for years, but haying is much delayed by unfavorable weather and much hay has been damaged. Potatoes are growing well, but none have been dug as yet. Apples now promise to be a fair crop. Pasturage is in extra good condition, in fact it was never better. Rye, oats and barley are very good crops. Tobacco is looking finely and now promises to be a good crop.

Stockbridge (F. A. Palmer). — Currant worms, potato bugs and the elm tree leaf beetle are doing some damage. Corn is very backward for the time of year; perhaps one-tenth of the crop will go into the silo. Continued rains have given a heavy growth of grass at the expense of quality. Corn is the principal forage crop raised. Early potatoes are poor and late; market-garden crops bring good prices, but all crops are late. There will be a fair crop

of apples, pears, plums and quinces. Pasturage is extra good. Rye is a good crop and oats and barley look well.

Lenox (Alex McConache). — Currant worms and potato bugs are doing some damage. Corn is looking well; I know of no silos in this vicinity. There is a very good crop of hay, double that of last year. Sweet corn is the principal forage crop raised, but some vetches and peas are raised. Potatoes are generally a poor crop with prices about as last year; other vegetables have done well. Fruit promises a fair crop at present. Pasturage is in good condition. Rye, oats and barley are not yet ripe. Haying is about two weeks behind.

Hinsdale (S. M. Raymond). — Potato bugs are doing some damage. Corn is very backward and the proportion put into the silo depends on how much of the crop gets ripe. The hay crop is better than usual in both quantity and quality. Hungarian grass and millet are the principal forage crops raised and are in good condition. Market-garden crops are good; potatoes late and price high. The prospect is favorable for all kinds of fruit. Pastures never looked better. Rye, oats and barley are looking well. It has been a late, cold and wet season.

Windsor (H. A. Ford). — Potato bugs are doing some damage. Corn is backward and one-fourth of the crop will be put into the silo. The hay crop is one-third larger than usual and the quality is good. Oats and barley are the principal forage crops raised. Apples promise to be a good crop. Pasturage is in fine condition. Rye, oats and barley are as good or better than usual.

Savoy (W. W. Burnett). — Potato bugs and cabbage worms are doing some damage. Corn is rather backward, but is growing fast and looking fairly well; a small share will go into the silo. Hay is ahead of the last few years in both quantity and quality. Corn, oats and Hungarian grass are the principal forage crops and all look well. Early potatoes are not yet ready to harvest. Apples are looking fairly; other fruits not of much account in this locality. Pasturage is in more than average condition. Rye, oats and barley are about average crops. Haying has been much delayed and hay injured by bad weather.

FRANKLIN COUNTY.

Charlemont (H. S. Giles). — Potato bugs and squash bugs are doing some damage. Corn is looking well and growing rapidly. Hay is above an average crop in quantity and of quite good quality. Fodder corn, Hungarian grass and barley are the principal forage crops. Market-garden crops compare well in yield and price with

former years. Apples a light crop; pears, peaches, plums and quinces not up to the average; grapes looking well. Pastures are looking finely. Rye, oats and barley are good average crops.

Buckland (C. E. Ward). — No serious damage from insects. Corn is coming forward fast now, but is tender and heavy storms are breaking it down somewhat; less than one-fourth of the crop will go into the silo. Quantity of hay large, but quality a little off; quite a little not cut because of bad weather. Fodder corn, Hungarian grass and barley are the principal forage crops, but less than usual will be raised. The prospect for the fruit crop is not good. Pastures are in excellent condition. Rye, oats and barley are little raised for grain.

Leyden (U. T. Darling). — No insects doing damage. Corn is small for the time of year; only three silos in town. The quantity of hay is good, but there is much grass to be cut and the quality will not be very good. Corn and barley are the principal forage crops. Potatoes do not promise well and many fields are badly blighted; price better than formerly. The prospect is very good for all kinds of fruit. Pasturage is in good condition. Rye, oats and barley compare favorably with other years.

Bernardston (R. H. Cushman). — Potato bugs are unusually plenty and cut worms have damaged tobacco badly. Corn is backward, but growing rapidly; I think more than half the crop will be put into the silo. Hay is a large crop of nice quality. Oats are grown for hay and several acres of barley are grown for green fall feed. Prices for market-garden crops low; potatoes sell well and the crop is looking well. Apples promise a fair crop and other fruits a full average. Pasturage is in extra condition. Rye, oats and barley have done well. Farm work has been retarded by wet weather, but haying is nearly done.

Deerfield (Chas. Jones). — Potato bugs are doing some damage. Indian corn has made a fair growth, but is late; only a small proportion will go into the silo. Hay is a little more than an average crop of fair quality. Potatoes are not quite up to the average and market-garden crops are not quite as good as usual. Apples, pears and peaches promise a light crop, but grapes are looking well. Pasturage is in good condition. Rye, oats and barley are good average crops. There has been too much rain for tobacco, but it is doing well now.

Montague (C. S. Raymond). — Squash bugs are doing some damage. Corn is still under size, but is growing fast and promises an abundant crop; about half the crop will go into the silo. The hay crop is larger than usual and of about average quality. Oats and peas are raised for early feed and corn for later.

Market-garden crops are good and potatoes above the average, with prices 25 per cent better than for some years. Apples below average; pears nearly a full crop; no peaches; plums, quinces and grapes about average. Pasturage is in exceedingly good condition. Rye, oats and barley are much better than for a number of years.

Wendell (N. D. Plumb). — Potato bugs are doing some damage. Corn is somewhat backward, but is growing fast; one-tenth will go into the silo. The hay crop is the best known for twenty years. Sowed corn is the principal forage crop and is in fair condition. Early potatoes are rotting very badly; barring rot the yield is good. Pears and apples will be good average crops; no other fruits grown. Pastures are in good condition. Rye, oats and barley are fully one-fourth larger than average crops. Hay is much delayed by the wet weather.

Orange (Ansel Harrington). — Potato bugs and squash bugs are very troublesome. Corn is looking fairly well, but is rather backward, especially on wet land; nearly all will be put into the silo. Hay made a heavy growth, but was badly damaged by wet weather. Corn, millet and oats are the principal forage crops; some pieces badly damaged by wet weather. Market-garden crops are about as in former years. Apples are very scarce, other fruits about average yields. Pasturage is in very good condition. Rye, oats and barley make good yields for forage; but little raised for grain.

HAMPSHIRE COUNTY.

Greenwich (Wm. S. Douglas). — Potato bugs and currant worms are doing some damage. Indian corn is in fair condition and a small proportion of the crop will be put into the silo. Hay is a large crop of good quality. Fodder corn is the only forage crop raised. Market-garden crops and potatoes are rather backward. There will be more apples than were at first expected. Pasturage is in good condition.

Enfield (D. O. Chickering). — Potato bugs are unusually plenty. Corn is backward, but is looking quite well as a rule. There has been an unusually heavy crop of hay and except on low land the quality is good. Fodder corn is the principal forage crop. Early potatoes are in good condition; late ones do not look as well. Pears, peaches, plums and grapes promise heavy crops; apples will be about half a crop. Pastures are in good condition. Rye, oats and barley are a little above average crops.

Belchertown (H. C. West). — Potato bugs are doing some damage. Corn was never growing faster; very little will be put into

the silo. Hay is a full average crop, but comparatively little has been harvested. Corn, barley, oats and millet are the principal forage crops. Most market-garden crops are in fine condition; much too wet for potatoes; prices way up. Apples fair, pears few, peaches few, plums fair, quinces fair and grapes good. Pasturage is in about average condition. Rye, oats and barley are full average crops.

South Hadley (H. W. Gaylord). — Potato bugs are doing some damage. Corn is backward owing to excessive rains; from one-half to two-thirds of the crop will go into the silo. Hay is an extra heavy crop, but the quality has been injured by the rains. Corn, oats and barley are the principal forage crops and are in good condition. Market-garden crops have suffered from the cold, wet season. Pasturage is in extra good condition. No winter apples; other fruits unevenly distributed, some having large crops and others next to none. Rye, oats and barley are rather better than average crops.

Williamsburg (F. C. Richards). — No insects at present. Corn is backward, although it has improved under the recent hot weather. Hay is a very heavy crop of good quality; it is a question whether it can be harvested before it is over-ripe, owing to the unfavorable weather. Oats are the principal forage crop and are in good condition. Apples half a crop, pears fair crop, peaches good and quinces medium. Pastures are in good condition.

Chesterfield (Horatio Bisbee). — Potato bugs are doing some damage. Corn came up poorly, but has made rapid growth of late. The hay crop is much better than we have had for several years. The early cutting was secured in fine shape, but much has been nearly spoiled by wet weather, and there is quite a quantity yet to come. Fodder corn, oats and Hungarian grass are the principal forage crops and are looking well. For an off year, the prospect for apples and pears is fairly good. Pasturage never was better. Rye, oats and barley are fair crops.

Huntington (H. W. Stickney). — Squash bugs and potato bugs are doing some damage. Corn is rather backward; not over one-third of the crop will go into the silo. Hay is a third more than an average crop, but the quality is not good, heavy rains having stopped haying and washed the grass which was down. Market-garden crops are not in as good condition as usual. Few apples, prospect for grapes and quinces good. Pastures are in fine condition. Rye, oats and barley are about average crops.

Middlefield (J. T. Bryan). — Potato bugs are causing some trouble. Corn is coming on well, but is about two weeks late. Hay is fully an average crop with more clover than for several

years, but dull weather has been unfavorable for haying. Corn, oats, peas and oats, soja beans and Hungarian grass are the forage crops raised, and all are in fine condition. Garden crops are looking well, and potatoes promise a full yield. Fruit promises to be abundant. Pasturage is in excellent condition. Oats and barley are looking all right, but none have been cut yet except for forage.

HAMPDEN COUNTY.

Blandford (E. W. Boise). — Potato bugs are doing some damage. Corn is fully two weeks late, but has a good stand and is growing fast; about one-third of the crop will be put into the silo and cut for fodder. Hay is fully 10 per cent above an average crop of good quality, but it is being housed with difficulty. Corn, oats, barley and Hungarian grass are the principal forage crops raised and are in average condition. Potatoes show a rank growth of tops but are decaying quite badly. Apples and pears promise fair crops. Pastures show a rank growth but stock does not take on flesh from it as it should. Rye, oats and barley are about average crops.

Southwick (L. A. Fowler). — Potato bugs are doing some damage. Corn has improved and is now looking well; a small proportion will be put into the silo. Hay is a more abundant crop than usual and of better quality. Oats and corn are the principal forage crops and are in good condition. Market-garden crops are in good condition; potatoes not quite up. All kinds of fruit are below the average. The recent warm rains have improved the pastures greatly. Rye, oats and barley are a little better than average crops. Tobacco looks finely in this locality.

West Springfield (J. N. Bagg). — The elm tree leaf beetle is very troublesome. Corn is fair but backward and uneven; possibly one-fourth of the crop will go into the silo. The hay crop is larger than usual. Fodder corn is the principal forage crop raised. Market-garden crops are in good condition with favorable prices. All fruits will be good average crops except peaches. Pastures are in excellent condition. Rye, oats and barley compare favorably with other years. Excessive rains have flooded crops on lowlands and standing water in hollows has ruined tobacco, potatoes and vegetables.

Chicopee (R. W. Bemis). — Corn is in fair condition. The hay crop is much above the average in quantity. Corn, oats and barley are the principal forage crops raised. Market-garden crops and potatoes show good condition and yield and the prices are good. Fruit of all kinds promises very well with pears promising an ex-

tra crop. Pasturage is in good condition. Rye, oats and barley are extra good but the weather is rather wet for harvesting.

Ludlow (C. B. Bennett). — Potato bugs are doing some damage. Corn is yellow and very backward; about one-tenth will go into the silo. The hay crop is extra large but of poor quality there being a great many weeds in it. Oats, barley, peas and corn are the principal forage crops and are good but backward. Potatoes show some blight. Apples light; pears fair; peaches, plums and quinces very light; grapes extra good. Pasturage never looked better. Rye, oats and barley are better than usual. We have had too much water and too little sunshine.

Wilbraham (F. E. Clark). — Potato bugs are doing some damage. Corn is just booming having more than doubled its growth in the past two weeks; about one-fifth of the crop will go into the silo. Hay is more than an average crop with the quality perhaps a little off. Corn, oats, peas, barley and soja beans are raised for forage crops and all promise well. Potatoes are generally looking well but there is some rot. Apples half a crop, pears three-fourths, and peaches and plums a full crop. Pasturage is waning now and dairy cows are shrinking badly. Rye, oats and barley have not been so heavy for several years.

Hampden (John N. Isham). — Squash bugs are doing much damage. Corn is backward and of poor color on moist land, but on dry land it is growing well. The hay crop is unusually heavy and of good quality. Rye, oats and corn are our principal forage crops and are in good condition except that oats are lodging. Market-garden crops above average in condition; potatoes yielding well; prices good. Apples hardly half a crop; other fruits good average crops. Pastures are in excellent condition. Rye light, oats and barley heavy.

Holland (Francis Wight). — Potato bugs and squash bugs are doing some damage. Indian corn is in exceedingly good condition; no silos in town. The hay crop is good both in quantity and quality. Corn fodder and oats are the principal forage crops and are in good condition. Potatoes are a good crop; none harvested yet. All fruits will be poor. Pastures are in good condition. Rye, oats and barley are full average crops.

WORCESTER COUNTY.

Warren (Wm. E. Patrick). — Potato bugs and wire worms are doing some damage. Corn is very backward, but has made splendid growth the past two weeks; only two silos in town. Hay is ten per cent above the average both in quantity and quality. Oats,

barley, fodder corn and Hungarian grass are raised for forage and are in excellent condition. Market-garden crops a good average; early potatoes medium; prices rather lower. Apples light, pears plenty, plums have dropped badly, few grapes. Pasturage is in splendid condition. Rye ten per cent above average, oats for forage very heavy, barley medium.

North Brookfield (J. H. Lane). — Potato bugs and black squash bugs are doing some damage. Corn is in as good condition as could be expected when one-tenth of the seed rotted in the ground. Hay is fifteen per cent above the average in yield and of excellent quality. Corn, oats and peas are the fodder crops and they are rusting because of the recent heavy rains. Market-garden crops average; potatoes vary very much. Apples, pears and peaches very light; plums half a crop, and cranberries three-fourths. Pasturage is very good indeed. Rye, oats and barley are average crops.

Barre (J. L. Smith). — Potato bugs are doing some damage. Corn is very backward; three-fourths of it will be put into the silo. Hay is the largest crop for several years, with much clover, and is of excellent quality. Corn, barley, Hungarian grass and Japanese millet are the forage crops grown. Potatoes are looking well. Apples will be half a crop. Pasturage is in extra good condition. Oats and barley are not quite as good as some years.

Oakham (Jesse Allen). — Potato bugs are doing some damage. Indian corn is very backward; about half the crop will go into the silo. There is a very large crop of hay of excellent quality. Corn, barley and Hungarian grass are the principal forage crops raised. Market-garden crops are in fairly good condition and potatoes are looking as well as usual. Very few apples; pears, peaches and grapes abundant; other fruits scarce. Pasturage is in excellent condition. Rye, oats and barley are light crops. Haying drags slowly because of the catching weather.

Hardwick (F. A. Ruggles). — Potato bugs are doing much damage. Corn is backward; no silos in town. Hay is first class on uplands and three-fourths of a crop on lowlands. Corn, millet, Hungarian grass, oats, and oats and peas are the forage crops raised and they are in poor condition owing to wet weather. Potatoes are looking poorly and none are harvested yet. Market-garden crops looking well. No apples, pears or peaches; plums, grapes and quinces plenty. Pasturage is in very good condition. Rye is a good crop but oats and barley incline to rust.

Rutland (L. S. Dudley). — Potato and squash bugs are doing some damage. Corn is in fair condition; about one-third will go into the silo. Hay is a large crop of very good quality. Corn,

barley and oats are the forage crops grown. Market-garden crops and potatoes promise well. Fruit of all kinds will be a light crop. Pasturage is in good condition. Rye, oats and barley are average crops.

Lunenburg (J. L. Harrington). — Potato bugs and striped squash bugs are doing some damage. Corn is in good condition and nearly all of it will be put into the silo. Hay is the largest crop for years and of good quality. Corn, oats, and oats and peas are the forage crops grown. Apples will be a light crop, especially Baldwins; pears good; plums and peaches loaded. Pastures have plenty of feed in them. A heavy crop of oats is being harvested, mostly for fodder.

Winchendon (W. H. Sawyer). — Corn is backward but looking healthy; three-fourths will be put into the silo. Hay is about an average crop. Fodder corn is the principal forage crop and is backward. Market-garden crops are good but backward; potatoes are beginning to be affected with blight. Fall apples promise well but there will be no winter fruit. Pasturage is in good condition.

Princeton (Preston Knight). — Potato bugs and striped squash bugs are doing some damage. Corn is small and backward; fifty per cent will be used for ensilage and fodder. Hay is about a third more than an average crop and the quality is good. Rye, oats and barley are the principal forage crops and they are in good condition. Market-garden crops are very fair and prices are a little better than last year. Peaches are a good crop and other fruits fair. Pasturage is very good indeed.

Bolton (H. F. Haynes). — Potato bugs are doing some damage. Corn is very backward and much broken by the storms. Hay is a large crop of good quality. Millet and oats are the forage crops raised. Market-garden crops are poor as are also the prices. Apples light, peaches and plums well loaded. Pasturage is in good condition. Rye, oats and barley are nearly all cut green but were good crops. Heavy rains caused the Nashua River to overflow doing much damage.

Shrewsbury (T. F. Marston). — Corn is late, but growing very fast; no silos. The hay crop is extra heavy, but off in quality. Millet and fodder corn are the principal forage crops, and millet is extra heavy. Market-garden crops, except potatoes, are not up to the average and prices are low. Pasturage is in extra good condition. Apples light, pears and grapes a fair crop, peaches and plums heavy. Rye, oats and barley are extra heavy being mostly grown as forage crops. The wet weather has retarded haying.

Holden (G. S. Graham). — Potato bugs are very plenty. Corn is backward, but is improving; about one-third of the crop will go into the silo. Hay is more than an average crop in quantity with fair quality. Oats, corn and millet are the principal forage crops and are looking well, except that oats are somewhat damaged by storms. Potatoes are inclined to blight. Pears, peaches, plums and grapes promise well. Pastures were never in better condition at this time of year. The dull wet weather makes haymaking uphill work and injures the quality.

Westborough (B. W. Hero). — Potato bugs are doing some damage. Corn has made rapid growth and is now in very promising condition; only a small portion will go into the silo. The hay crop is very large and the quality nearly as good as in former years. Oats and peas are the principal forage crops. Market-garden crops are abundant and prices rule very low. Very few apples; large crop of pears, peaches, plums and quinces. Frequent showers have kept the pastures in excellent condition. Rye, oats and barley are raised mostly as forage crops.

Millbury (C. H. Stockwell). — Cabbage worms, squash bugs and maggots and potato bugs are doing some damage. Corn is still backward; but little will go into the silo. There is a heavy crop of hay, but the quality is much injured by bad weather at cutting time. Corn is the principal forage crop. Market-garden crops are growing well. Potatoes a good yield, with prices moderate. There will be a few apples, pears and peaches, and an abundance of plums, quinces and grapes. Pastures are holding out well. Oats, rye and barley made a rank growth and are very well filled out for grain.

Oxford (D. M. Howe). — Corn is growing nicely, but is rather late; three-fourths of the crop will go into the silo. Hay is more than an average crop of fine quality. Corn is the principal forage crop raised. Market-garden crops are in good condition; yield of potatoes good and prices good. Apples and pears light, peaches fair, no plums, few quinces, and grapes good. Pastures are in good condition. Rye, oats and barley are good average crops. There bids fair to be a great crop of rowen.

Northbridge (H. A. Cook). — Cut worms are doing some damage. Corn came up very unevenly, but is doing well; three-fifths of the crop will be put into the silo. Hay is more than an average crop of good quality. Oats and barley are the principal forage crops. Market-garden crops are average, with prices low. Very few apples, but a fair crop of pears, peaches, plums and grapes. Pasturage is uncommonly good. Rye, oats and barley are but little raised.

MIDDLESEX COUNTY.

Hopkinton (W. V. Thompson). — Potato bugs and squash bugs are doing some damage. Corn is good, but a little late; the usual amount will go into the silo. Hay is a larger crop than for some years. Hungarian grass is the principal forage crop raised. Not many market-garden crops are raised here. No apples; pears, peaches and plums full crops. Rye, oats and barley are good crops.

Sudbury (E. W. Goodnow). — Potato bugs and asparagus beetles are doing some damage. One of the best and largest hay crops on record is being harvested. Fodder corn is the principal forage crop and is looking well. Market-garden crops are about normal in yield and price. Apples scarce, pears plenty, peaches and plums scarce, grapes and cranberries looking well. Pastures never looked better at this time of year. Rye, oats and barley are about normal crops.

Maynard (L. H. Maynard). — Corn is extra good and probably three-fourths of the crop goes into the silo. Hay is an extra good crop, though some old lands are light. Corn and peas and oats are the principal forage crops and are in good condition. All market-garden crops look well; potatoes extra, not many harvested yet. Apples are short, all other fruits abundant. Pasturage is in good condition. Rye, oats and barley are better than average crops.

Boxborough (J. F. Hayward). — Potato bugs are doing some damage. Indian corn is in good condition. Hay is a third better than an average crop in quantity and of good quality. Millet and fodder corn are the principal forage crops. Apples and quinces will give small crops, but other fruits are looking well. Pasturage was never in better condition. Rye, oats and barley are rather more than average crops.

Westford (Arthur Wright). — Potato bugs are doing some damage. Hay is a large crop of good quality. Corn is the principal forage crop raised. Potatoes are looking well, but few are harvested yet. No winter apples, fall apples an average crop; blackberries and raspberries good. Peaches are looking especially well, and Westford has some very fine orchards. Pasturage was never better at this time of year. Rye, oats and barley are good average crops.

Dunstable (A. J. Gilson). — Potato bugs and striped and black squash bugs are doing some damage. Corn is later than usual, but is now growing very rapidly; only a small amount raised for silo. Hay a large crop of ordinary quality. Corn, rye, Hungarian grass and oats are the principal forage crops. Some early planted

potatoes are doing finely. Apples almost a total failure; grapes promise very well; few other fruits. Pasturage is in good condition. Rye, oats and barley are about average crops.

Ashby (Anson Wetherbee). — Potato bugs, currant worms and horn flies are doing some damage. Corn is about three weeks late; a large part of the crop will go into the silo. Hay is the largest crop for several years and of good quality. Hungarian grass, barley and oats are the principal forage crops and are in good condition. Pears, peaches, plums and grapes will be full crops; there will be some apples, and a few cranberries and quinces. Pasturage is in the best of condition. Rye looks well, oats fair and barley fair. Grain is lodging badly in some places.

Bedford (Henry Wood). — Potato bugs and squash bugs are doing some damage. Corn looks well, but is late; but few silos in town. Quantity of the hay crop large and quality fair. Oats, millet and corn, with some cow peas, are the principal forage crops. No potatoes have been marketed yet. Apples will be scarce, pears plenty, and grapes scarce. Pasturage never was better. Rye, oats and barley are good, being raised for forage crops.

Wakefield (Chas. Talbot). — Potato bugs are doing some damage. Corn is very good, and about three-fourths of the crop will go into the silo. The hay crop is 20 per cent greater than last year's and mostly housed in good order. Barley, oats and rye are the principal forage crops and are all doing finely. Potatoes are looking finely and yielding well; all market-garden crops are looking finely. No apples, pears a large crop, grapes never more plentiful, cranberry vines loaded. Pop corn is planted in large quantities and is doing well.

Lincoln (Samuel Hartwell). — Corn on high land is looking well; very few silos in use in this town. The hay crop is exceedingly large, but the quality has been much injured by bad weather. Fodder corn, millet, barley and oats are the principal forage crops and are looking well. Market-garden crops look well on high land, yield large, prices small. Apples scarce; pears, peaches, quinces and grapes abundant. Pastures never looked better at this time of year. Rye, oats and barley are not much raised, but the fodder looks well. Weeds are very troublesome on account of the excessive rains.

Weston (H. L. Brown). — Squash bugs, potato bugs and plant lice are doing some damage. Hay is a large crop and has been mostly secured in good condition. Corn for the silo and millet are the principal forage crops. Market-garden crops in good condition; potatoes looking well; peas have hardly paid for picking. Some fall apples, no winter apples; pears, peaches and all other

fruits promise fair crops. Pastures are in good condition. Rye, oats and barley are only raised for forage and are all good crops. Rowen has made a good start and promises well.

ESSEX COUNTY.

Haverhill (Eben Webster). — Black squash bugs and currant worms are doing some damage. Corn is a little backward, but of good color; about three-fourths of the crop will go into the silo. The hay crop is larger than usual and of fair quality. Oats, barley and corn are the principal forage crops and are in good condition. There will be but few apples, pears plenty, grapes good, not many peaches or quinces. Pasturage is in good condition.

West Newbury (J. C. Tarleton). — Horn flies and potato bugs are doing some damage. Corn is very backward and small; only a small quantity will go into the silo. Hay is the largest crop for years and of good quality. Barley, oats and corn are the principal forage crops and are in good condition. Garden crops are very late and not very good, and nothing has been harvested as yet. There are not many apples, pears good, no peaches and plums, grapes looking nicely and cranberries show a full bloom. Pasturage is in very good condition. No grain has been threshed as yet.

Newbury (Geo. W. Adams). — Potato bugs and cut worms are doing some damage. Indian corn is in fair condition and about 10 per cent will go into the silo. Hay is above the average in quantity and quality. Fodder corn, oats and rye are the principal forage crops raised and are in good condition. Market-garden crops are not satisfactory and potatoes did not come up well; prices fair. Very few apples, pears a full crop, other fruits about average. Pasturage is in good condition. Rye, oats and barley compare favorably with other years.

North Andover (Peter Holt, Jr.). — Corn is late and small and will hardly ear out; nearly all of it will go into the silo. The hay crop is nearly a third larger than usual, but much has been damaged by bad weather. Corn fodder and Hungarian grass are the principal forage crops and the latter is looking very well. All market-garden crops are late and small; no potatoes have been harvested. No apples, a fair crop of pears, a few peaches and grapes looking well. Pastures never looked better at this season of the year. Oats have been a very heavy crop and were mostly cut for fodder. The hay crop is nearly all secured in a more or less damaged condition.

Topsfield (B. P. Pike). — Corn is late and uneven, but growing well; about 20 per cent will go into the silo. Hay is the largest

crop for years and is in excellent condition. Corn, oats and Hungarian grass are the principal forage crops. Sweet corn is very uneven. Potatoes are looking well. Apples are scarce, but other fruits promise good crops. Pasturage is in good condition. Rye, oats and barley are average crops. Prices are low for garden truck; not many potatoes dug as yet, quality fair.

Manchester (John Baker). — Squash maggots, currant worms and potato bugs are doing some damage. Indian corn is looking well; there are no silos in town. Hay is a good crop both in quantity and quality, but it has been poor weather for harvesting. Corn, rye, oats and Hungarian grass are the principal forage crops and are in good condition. Market-garden crops are generally fairly good, but potatoes are rather poor; prices good. There are no apples to speak of, but other fruits are good. Pastures are getting a little dry. Rye, oats and barley are about normal crops.

Danvers (C. H. Preston). — Corn is in good condition except where it did not germinate well. There is a very large crop of hay of good quality. Barley, Hungarian grass and peas and oats are the principal forage crops raised. Market-garden crops, including potatoes, are good in yield and price. Some early apples; pears, peaches and plums plenty. Pastures are in good condition. Rye, oats and barley compare well with former years.

NORFOLK COUNTY.

Dedham (A. W. Cheever). — Squash vine borers are doing some damage. Corn is rather late, but is healthy except where blown down and broken; only a small proportion of the crop will go into the silo. The hay crop is larger than usual and of fair quality. Corn and millet are raised for forage to a limited extent and are in good condition. Market-garden crops are in fair condition, but prices are low. Prospect poor for apples, but good for pears, peaches, plums, quinces and grapes. Pasturage is in good condition for the season. Rye, oats and barley are raised chiefly for forage, and compare favorably with the normal.

Millis (E. F. Richardson). — Potato bugs are doing some damage. Indian corn is in fine condition, but is very small. Hay is an immense crop of good quality. Peas and oats and corn are the principal forage crops and are in good condition. Market-garden crops are good, potatoes a fair yield; prices low. Few apples, but lots of pears and plums. Pasturage is in excellent condition. Rye, oats and barley are more than average crops.

Franklin (C. M. Allen). — Nearly all kinds of insects have been more plenty than usual. Much corn had to be replanted, so

it is very backward, but is growing fast and may be nearly an average crop. Hay was a very heavy crop, but was damaged more than ordinarily by bad weather. Corn is the principal forage crop with some barley; condition second rate. Market-garden crops and potatoes are not up to the average. Apples half a crop; pears, peaches and plums full crops; grapes nearly a full crop. Pasturage is in fine condition. Rye, oats and barley are good crops, but somewhat damaged by wet weather.

Norfolk (G. E. Holbrook). — Potato bugs are doing some damage. Corn is very small and backward, but is doing better now; mostly raised for grain. Hay is more than an average crop. Millet, Hungarian grass and sweet corn are the principal forage crops, and all show the effects of cold nights. Market-garden crops good, and potatoes a nice crop. All fruits will be good with the exception of apples, which will be light. Pasturage is in very good condition. Very little rye, oats and barley raised except for forage, but they are looking well. The town has lost from last year sixty-one milch cows and twenty-one other cattle; cause, tuberculosis and the low price of milk.

Wrentham (Thomas Breen). — Potato bugs, squash bugs and rose bugs are doing some damage. Corn is in good condition; the proportion put into the silo will be small. Hay is a full crop of good quality. Potatoes do not promise well, but market-garden crops are very good. Apples will be half a crop, pears a full crop, grapes plenty, other fruits not much raised. Pasturage is in good condition. Rye, oats and barley are full average crops.

Sharon (H. L. Naramore). — Cut worms are doing some damage. Corn has made great improvement and is now in good condition, but is troubled by the corn worm. The hay crop is the largest and best for ten years at least. Market-garden crops are in good condition and prices are about as in the last three years. Prospect poor for all fruit except pears which will yield about an average with other years. Pasturage is excellent as compared with other years, but is always poor in this section. Rye, oats and barley are little raised, but are below the average.

Randolph (R. A. Thayer). — Potato bugs and cut worms are doing some damage. Corn is in fine condition and 90 per cent of the crop will go into the silo. Hay is a very large crop of good average quality. Fodder corn, millet and barley are the principal forage crops and are all in good condition. Market-garden crops have made very large yields with very low prices except for potatoes. Apples very small crop, pears and grapes average, others little raised. Pastures are very good for the time of year. Rye, oats and barley have made very large growth; used entirely for forage.

BRISTOL COUNTY.

Attleborough (Isaac Alger). — Indian corn is in good condition. The hay crop is very large and of fine quality, and was secured in good order. Frequent light showers have made the prospect for rowen excellent. Corn, millet, Hungarian grass and barley are the principal forage crops and are in excellent condition. Apples poor, pears fair, no peaches, grapes good and cranberries fair. Rye, oats and barley are more than average crops.

Norton (Wm. A. Lane). — Potato bugs and squash bugs are doing some damage. Corn is looking well; no silos in town. Hay is a large crop of good quality. Oats and Hungarian grass are the principal forage crops. Market-garden crops and potatoes are not quite up to the average of former years. No apples or peaches; plenty of grapes. Pasturage is good for the time of year. Rye, oats and barley are about normal crops.

Seekonk (Solon Carpenter). — Potato bugs are doing some damage. Indian corn is in very fair condition; small amount used for ensilage. The hay crop is better than usual. Corn and Hungarian grass are the principal forage crops. Market-garden crops are in good condition; potatoes a fair crop and prices much better than usual. The prospect for all kinds of fruit is not good. Pasturage is in very fair condition.

Rehoboth (J. G. Little). — Potato bugs and squash bugs are doing some damage. Corn is very backward and will all be used for fodder. Hay is a heavier crop than last year and of fine quality if cut in time. Oats and millet are the principal forage crops and are in fine condition. Potatoes made a fair yield and brought fair prices. Grapes are the only kind of fruit which is plentiful. Pasturage is in good condition. Oats, rye and barley have made heavy yields.

Dighton (J. N. Paul). — Indian corn is in good condition; very little will go into the silo. Hay crop very large in quantity and very good in quality. Corn, Hungarian grass and barley are the principal forage crops and are in good condition. Market-garden crops are in good condition; potatoes not as good as last year, price better. Apples, plums, peaches and quinces not very good; pears and grapes good. Pastures are in good condition. Rye, oats and barley about average crops. New strawberry plants are looking well and have commenced to make plants. The gale of the 13th and 14th did much damage to fruit trees and growing crops.

Raynham (N. W. Shaw). — All kinds of insects are more troublesome than usual. Corn is very backward and but little planted; no silos in town. The hay crop is much larger than

usual and of good quality. Very few crops are raised for forage. Those market-garden crops which are harvested have not yielded well and prices are low. Apples are dropping off, peaches good, plums plenty and grapes looking well. Pasturage is in very good condition. Rye, oats and barley are about average crops. Haying is not yet finished owing to the rainy weather; some has lain out for a week on account of the rains and is much injured.

Dartmouth (L. T. Davis). — Potato bugs are doing some damage. Corn is very good but a little backward; about three-fourths of the crop will go into the silo. Hay is more than an average crop and most of it is of good quality. Corn, barley and oats and peas are the principal forage crops. Market-garden crops are about average in yield and price. Apples not half a crop, pears three-fourths, peaches half a crop, plums full crop, quinces three-fourths and grapes a full crop. Pasturage is still very good. Rye, oats and barley are about normal crops. Hay is mostly secured in fair condition.

PLYMOUTH COUNTY.

Hingham (Aaron Low). — Potato bugs and yellow squash bugs are doing some damage. Corn has grown well lately but was very backward the first of the season. The hay crop was very large but of rather poor quality. Corn and Hungarian grass are the principal forage crops raised. Peas have produced largely, prices low; potatoes good; cabbages doing nicely. Not many apples, pears fair, peaches and plums dropping badly. Pasturage is in good condition. Rye, oats and barley are very heavy crops. The army worm has not made its appearance as yet.

West Bridgewater (F. E. Howard). — Potato bugs are doing some damage. Indian corn is looking quite well considering its backward start; half the crop will go into the silo. The quantity of hay is enormous; the quality would be better if the quantity were less. Hungarian grass and fodder corn are the principal forage crops and are in fair condition. Market-garden crops are quite good; potatoes a good yield, prices low. Apples poor, some pears, no peaches; plums, quinces, grapes and cranberries about average. Pasturage is in first-rate condition. Rye, oats and barley are about normal crops.

Hanover (H. L. House). — Cut worms are doing some damage. Corn is in very good condition; a very small part will be put into the silo. Hay crop very heavy and generally of good quality. Oats and Hungarian grass are the principal forage crops. Market-garden crops are very good, yield and price being about as last

year. Apples, pears, grapes and cranberries promise very good crops; very few peaches, plums and quinces raised. Pasturage is in very good condition. Rye, oats and barley are full average crops.

Hanson (F. S. Thomas). — Squash bugs and the squash vine borer are doing some damage. Indian corn is in good condition; none will be put into the silo. Hay crop extra good in both quantity and quality. Market-garden crops are extra good. Almost no apples; few peaches; many pears, plums and grapes. Pasturage is in fine condition.

Marshfield (J. H. Bourne). — Potato bugs, horn flies, cut worms, white grubs and squash bugs are doing some damage. Corn is greatly improved and is growing finely; one-fourth will be put into the silo. Hay crop a third larger than last year and of average quality. Fodder corn, Hungarian grass, soja beans, oats and barley, with some peas, are the principal forage crops. Early potatoes show double the crop of last year with better prices; market-garden crops good. No apples; pears, peaches and grapes favorable; cranberries looking well. Pasturage is abundant, but begins to feel the effect of dry weather. Rye, oats and barley are all well filled with a little less straw than usual.

Kingston (J. H. Cushman). — Potato bugs are doing some damage. Corn is looking well, but is late. Hay is a large crop of good quality. Oats, rye and millet are the principal forage crops and are in good condition. Gardens are good, though sweet corn is somewhat broken by the high winds; potatoes a good crop. Pears and grapes promise average crops. Pastures are getting short and cows are fed some from forage. Rye and oats are heavy with grain. The high winds did some damage to early fruits and to grass and corn.

Mattapoisett (A. R. Swift). — Potato bugs and white grubs are doing some damage. Indian corn is in good condition; not many silos in town. The hay crop is from one-fourth to one-third larger than last year and of good quality. Corn, oats and rye are the principal forage crops. Market-garden crops are in good condition. Yield of potatoes good and prices higher than last year. Off year for apples and pears. Cranberries have set well on some bogs, but others are not yet out of bloom. Pastures are in good condition. Rye, oats and barley are about average crops.

BARNSTABLE COUNTY.

Bourne (D. D. Nye). — Potato bugs are doing some damage. Indian corn is in excellent condition; no silos in town. Hay crop

larger than usual and of good quality. Oats are the principal forage crop. Market-garden crops in average condition; potatoes looking finely, and prices up to last year. Cranberries have blossomed well. Pastures are looking better than last year. Oats as forage have exceeded expectations.

Falmouth (D. R. Wicks). — Potato bugs are doing some damage. Sweet corn is looking finely, but is ten days late. Hay is a full crop in quantity, but the weather has been bad to house it. Market-garden crops are and have been very good; potatoes are blighting some. Cranberries promise full crops; other fruits, except pears, are very poor. Pasturage is in fine condition. Oats are cut green for hay and are an average crop.

Dennis (Joshua Crowell). — Cranberry vine worms are doing some damage. Corn is backward, but otherwise in good condition; none goes into silos. Hay is above the average as to quantity and quality. Fodder corn and Hungarian grass are the principal forage crops and are in good condition. Market-garden crops are hardly up to the average; prices about as usual. No apples; pears not plenty; cranberries considerably less than last year. Pasturage is fairly good for the season. Rye, oats and barley are about average crops.

Harwich (A. N. Doane). — Potato bugs and cranberry worms are doing some damage. Indian corn is in good condition; not many silos in town. Hay is very much in excess of the usual crop. Potatoes are a good crop; prices lower than usual. No apples, cranberries fair crop. Pasturage is all used up. Rye, oats and barley are good crops.

Eastham (J. A. Clark). — Plant lice are doing some damage. Not much corn is planted and what there is is backward; no silos in town. Hay is a very good crop in quantity and quality. Oats are the principal forage crop. Potatoes are a good crop, and prices better than usual. There are some early apples, but very few late ones. Pasturage is in fair condition. Acreage of all grains small.

Wellfleet (Everett Jacobs). — The corn worm and the squash bug are doing some damage. Corn is in very good condition; no silos in this section. The hay crop is good in quality and very large in quantity. No special forage crops are raised, our farmers depending on hay and grain. Market-garden crops are better than last year both in yield and price. Apples will be very scarce; but peaches, pears and grapes are quite plenty. Pasturage is in very good condition. There is no rye or barley raised and very few oats.

NANTUCKET COUNTY.

Nantucket (C. W. Gardner). — Potato bugs were never so plenty as they are this year. Indian corn is not very promising. Hay was a heavy crop of good quality. Oats are the principal forage crop, but there are but few raised. Market-garden crops are in good condition, with prices about as usual. Cranberries are looking finely. Pasturage is in very fine condition. Rye, oats and barley are much better than usual. Much hay was damaged by the wet weather at cutting time.

DUKES COUNTY.

West Tisbury (Geo. Hunt Luce). — Potato bugs are doing some damage. Indian corn is in fair condition; we have no silos. The hay crop is better than an average crop and of good quality. Potatoes are about an average crop with the price better than usual. The prospect for apples is fair and for grapes good. Pastures are in better than average condition. Oats are not quite up to a normal crop.

BULLETIN OF

MASSACHUSETTS BOARD OF AGRICULTURE.

WHY MILK SOURS, AND HOW THE SOURING CAN BE PREVENTED OR AT LEAST DELAYED.

By Geo. M. Whitaker, A.M.,
Acting Executive Officer of the Massachusetts Dairy Bureau.

During the hot summer weather milkmen have much trouble with sour milk and there is especial complaint of the large amount of sour milk in Boston. In spite of the thousands of cans of surplus, when the pinch of a warm spell comes, the surplus is wiped out by the sour milk, and the contractors have hardly enough sweet milk to supply their trade. The same is true, though to a less extent, in other places. Now, this is unnecessary. So much is known about the causes of milk souring that any farmer can avail himself of this information and profit thereby. Sour milk is inexcusable nowadays, and here is one of the things wherein modern science has done much for dairying. The souring of milk is caused by the presence in it of bacteria, the tiniest forms of organic life known; no bacteria, no sour milk.

Milk in the udder of a healthy cow is free from bacteria, the germs of decay coming chiefly from the air. If milk could be drawn through a sterilized tube into an air-tight sterilized pail it would remain unchanged for all time. Bacteria are numerous in the air, and under ordinary conditions it is absolutely impossible to have milk without any bacteria at all. We cannot expect to prevent the entrance of all bacterial life into milk, but the number may be greatly diminished by certain precautions. They are intimately associated with dirt and carelessness, and by the exercise of scrupulous care and the observance of cleanliness we may keep the number of bacteria down to the lowest possible limits. Then

it is a fact that bacteria cannot increase rapidly in a temperature of less than 55°; when the temperature gets down to this their increase is practically suspended. Hence, if the number of bacteria is reduced to a minimum to begin with, and then if the milk is promptly cooled with ice or spring water to 55° or below, the keeping qualities of the milk will be greatly increased, and there will be no trouble from sour milk in the ordinary course of getting it to consumers. One authority says that by these precautions milk may be kept merchantable a week or ten days. This is of the utmost importance to farmers, particularly those who ship milk to cities.

The whole "secret" of avoiding sour milk trouble is in three words, — cleanliness, prompt cooling. With these milk will withstand even the traditional influences of the thunder shower.

The first source of the infection of milk with the bacteria of souring seems an exception to the above general statement. These bacteria get into the milk pail in the first few drops drawn from the udder. At the close of the previous milking a little milk is always left at the end of the teat, a drop often remaining in the little orifice near the end of the teat. Here the bacteria multiply to an enormous extent, the warmth of the animal body furnishing excellent conditions for their increase. When the next milking is commenced they are washed into the pail to contaminate the whole of the milking and shorten its life. A material increase of the keeping properties of milk will follow from milking on the floor the first streams from each teat, enough to rinse them out.

The next and most common source of infection is through the air which is always loaded with bacteria. The number of bacteria in the air varies very largely but the germs are more numerous in inclosed spaces like rooms than in the open air. Hence, when cows are milked in the barn the milk will have more bacteria than when they are milked in the open field. We cannot tell all of the ways in which these bacteria get into the air, but we do know that they come from particles of manure, skin, food, hair, threads and cobwebs. They are intimately associated with the dust floating in the air. From the body of the animal, the hands of the milker or his clothes may also come the troublesome little "bugs." Hence the more filthy the conditions the more bacteria and the sooner the milk sours. Professor Sedgwick says "short-lived milk is usually filthy milk." Another authority says: "Sour milk is due to dirty handling." Grotenfelt says: "The impure air in the stable is one of the main causes of bacterial infection of milk."

Stables. — The barn should be cleaned at least annually, removing dust and cobwebs from timbers and corners, and cleaning out

all refuse and rubbish. It should then be thoroughly whitewashed. This not only removes many microbes and introduces a weak antiseptic but it renders the stable lighter and more cheerful. Any work in the barn which stirs up a dust just before milking will greatly add to the number of the bacteria in the air and therefore in the milk. Chores which contaminate the air should be deferred till after milking. Frequent sweeping of the barn is a good idea, but it had better be omitted if it can be done at no other time than immediately before milking. Manure ought to be removed from the stable promptly, as the longer it remains in the warm stable the more the bacteria in it multiply, but wait until after milking before you do this work. Many barns are made so that it is impossible to avoid pitching hay from the mows or high beams in the room where the cattle are kept. This is favorable to stirring up a dust and therefore it ought not to be done just before milking. Feeding coarse fodder directly before milking, stirring up masses of dust, is not to be commended. Sprinkling stable floors before milking will materially lessen the germs in the milk. The free admission of outside air into the barn is also an important consideration. By care it is possible to decrease considerably the infection of milk through the ordinary dust of the stable.

The Cows. — When the cow's flanks are covered with filth, either manure or the mud of some pasture pool, the amount of bacteria that will fall into the milk is enormous. Consequently the skin of the cows should be kept as clean as possible. The importance of carefully carding, brushing and cleaning the cows is evident. To get the best results the udder and the teats, together with the adjoining parts of the body and thighs, should be wiped with a damp cloth immediately before milking. These precautions will reduce to the lowest terms the bacteria which will get into the milk pail from the cow.

The Milker. — The milker himself must practise personal tidiness, and the leading authorities, where the best results are to be obtained, both preach and practise the importance of strict cleanliness and even the wearing of neat clothes while milking. The milker's hands should be carefully washed.

Removing from Stable and Straining. — As we have said above, no matter how carefully the precautions against micro-organisms are observed there will be bacteria in the air. The milk is therefore threatened so long as it is in the stable, and it is also liable to absorb odors as well as bacteria. Milk should therefore be removed from the stable at the earliest possible moment. Straining the milk in the stable or leaving it there in the cans until the whole herd has been milked are procedures harmful to its quality. A

minute's delay in the barn may mean an hour's quicker souring. Milk always ought to be strained in a room separate from the stable, where the air is pure and fresh, and where cleanliness is most carefully observed.

Several thicknesses of strainer cloth through which the milk is allowed to trickle slowly will filter out many bacteria as well as much filth. It is therefore important, in a herd of any considerable size, to change the strainer cloth often, as it soon becomes impregnated with bacteria which have been entangled in its meshes, and some of these are liable to wash through into the milk if the same cloth is continually used. The more unclean the milk the more frequently the change of strainer cloths should take place. The more violently the milk is poured into the strainer the greater the chance of the force of the stream driving some bacteria, which had become entangled in the strainer, through into the strained milk.

A third cause of infection is unclean utensils and cans. If these are not washed with the greatest care and thoroughly scalded and aired there is an opportunity for impurities to be left in the seams of the tin where joints occur. In this residue there is a fine opportunity for bacteria to increase and multiply in large quantities, and then spread the contamination through the milk itself. The word cleanliness, when carried to its extreme import, nowadays, means sterilization, — freedom from bacteria. Wooden pails should never be used for milking as it is almost impossible to keep them clean. Tin utensils should be used. In cleaning them the milk remaining should be rinsed out with lukewarm water. Then boiling hot water or steam should be applied, as these are among the strongest foes to bacteria. Live steam is best but not always practicable. After scalding, exposure to bright sunlight is advisable and ought to be given. It is common to see inverted cans standing by farmers' doors, sunning the outside of the cans. If the location is one where the air is pure the cans should be set so that the direct rays of the hot sun may get into them.

Finally, having done all that is possible in way of care and cleanliness, you have not kept all the bacteria out of the milk. The ravages of the few remaining ones must be reduced as much as possible. This is done by chilling the milk at the earliest possible moment. Bacteria increase most rapidly in warm milk. One experimenter found that at 93° the bacteria in milk multipled 3,600 times in six hours. At 55° they multiplied only 435 times. Don't let the milk stand a moment longer than is necessary without chilling it. Delay is dangerous and may be costly. This cooling of milk is beneficial in removing the last traces of animal

odor, but it is urged more particularly for checking the growth of bacteria. If the temperature is lowered sufficiently, the development of bacteria will be checked — almost stopped. By lowering the temperature to 45° satisfactory results may be obtained, but it is safest to cool it to 40° if possible. Every person supplying a city market with milk should have ice, or else cool spring water, and take precautions in this respect. All authorities impress the importance of straining the milk outside the stable and cooling it as quickly as possible. Don't let it stand until the cows are turned out; they can wait better than the milk.

In conclusion, — milk, leaving the udder almost in a spray, comes in contact with a large quantity of bacteria-laden air. This milk is of a temperature most congenial to bacterial growth, hence the first half hour of its life is the critical one. The way it is treated during that time determines its keeping qualities, and to a considerable extent its flavor. No wonder the best teachers say that sour milk is due to careless handling. As a matter of theory milk cared for as we have recommended will keep a long time, amply sufficient to have it reach any consumer in good condition, and the following of these suggestions will add many hours to its life. As a matter of practice many farmers take these precautions and are never troubled with sour milk. A German experimenter had a cow kept in a badly ventilated barn and milked without having its udder cleaned, and the milk, kept at 60°, coagulated in fifty hours. The milk from the same cow drawn in an open field, after the hands of the milker and the cow's udder had been cleansed, kept, at the same temperature, eighty-eight hours. Hence we have both theory and practice to back up these ideas. What one farmer has done another can do. With proper precautions there would be no renewal of the great trouble which annually exists in Boston and elsewhere during the "heated term" on account of sour milk.

Series of 1897. Bulletin No. 4.

MASSACHUSETTS

CROP REPORT

FOR THE

Month of August, 1897.

ISSUED BY

WM. R. SESSIONS,

Secretary State Board of Agriculture.

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Crop Report for the Month of August, 1897.

Office of State Board of Agriculture,
Boston, Mass., Sept. 1, 1897.

Bulletin No. 4, Crop Report for the month of August, is herewith presented. Particular attention is called to the article on "Systematic Feeding and Watering as a Preventative of Disease in Horses," by Dr. Jas. B. Paige veterinarian of the Board of Agriculture, which is printed at the end of this bulletin.

Progress of the Season.

Report No. 151 (August, 1897) of the Statistician of the United States Department of Agriculture indicates an improvement in the condition of corn of 1.3 points, the average having risen from 82.9 to 84.2. This average is 11.8 points lower than at the corresponding period last year, and 3 points lower than the August average for the last ten years. There is a more or less decided improvement in nearly all the principal corn-producing States.

The condition of spring wheat is 86.7, being 4.5 points lower than last month, but 7.8 points higher than last year, and 4.5 points higher than the August average for the last ten years.

The average condition of spring rye is 89.8, as compared with 90 last month, 88 on Aug. 1, 1896, and 86.8 the August average for the last ten years.

The average condition of oats is 86, as compared with 87.5 last month, 77.3 on Aug. 1, 1896, and 83.2 the August average for the last ten years. The consolidated returns indicate that about 10 per cent of the oat crop of last year is still on hand. Both the actual amounts and the percentages are highest in the States of principal production.

The average condition of barley is 87.5, as compared with 88.5 last month, 82.9 on Aug. 1, 1896, and 85.8 the August average for the last ten years. Good averages are reported from California, Minnesota, Iowa and Wisconsin, which States produce considerably over two-thirds of the total crop.

The area of buckwheat is 4.8 per cent less than that of last year. The average condition is 94.9, as compared with 96 at the corresponding period of last year and 91.4 the August average for the last ten years.

The average condition of Irish potatoes fell during July from 87.8 to 77.9, which latter figure is 16.9 points lower than on Aug. 1, 1896, and 9.5 points lower than the August average for the last ten years. The decline in condition has been general throughout all the States of principal production.

The condition of tobacco, taking the country as a unit, is practically unchanged, the returns indicating 78.7 per cent of a full crop, as compared with 78.5 per cent last month, 86.5 per cent on Aug. 1, 1896, and 81.6 per cent the August average for the last ten years.

The cotton returns indicate an average condition of 86.9, as compared with 86 on July 1, 80.1 on Aug. 1, 1896, and an August average of 86.1 for the last ten years.

Rice has fallen off in condition from 5 to 15 points in all the States of principal production, drought, cut worms and chinch bugs being the principal causes of the deterioration.

The total area of the hay crop is 1.9 per cent less than last year. The prospect for grass was very fine before cutting generally throughout the country, but in many States the excessive wet weather delayed cutting and seriously injured the quality of the crop.

The average condition of pastures is very high, an average exceeding or closely approaching 100 being reported from three-fourths of the States.

The reports from the few States in which West India sugar cane can be successfully grown are very favorable, Louisiana and Florida each having a percentage of 90.

Reports on sorghum are in the main favorable, but there are some reports of excessive heat, drought and chinch bugs.

The condition of hops in the State of New York is only 71

per cent of the normal. High conditions, however, prevail on the Pacific coast.

There are few important peach-growing sections of the country that do not report this crop as considerably below the normal. Delaware and eastern Maryland, it is reported, will have but one-tenth of a crop. Of the States that produced one million bushels or upward at the last United States census, Arkansas, Missouri and California are the only ones that will reach this year even so much as four-fifths of a crop.

There are very few extensive apple-producing States whose reported conditions indicate more than one-half to three-fourths of a normal crop, and generally the inclination is toward the lower rather than the higher average. Not only is the yield much below the average, but, except in a few States, the quality of the fruit is decidedly inferior.

The reports on the grape crop are in the main fairly satisfactory, the principal grape-producing regions, both of the east, the middle west and the Pacific coast, reporting excellent prospects. In the south the crop is more or less abundant, but there are serious complaints of rotting.

In Massachusetts the average condition of corn August 1 is given as 78; the average condition of spring rye as 110; the average condition of oats as 84; the average condition of barley as 86; the acreage of buckwheat as compared with last year as 95 and the condition as 92; the average condition of potatoes as 80; the average condition of tobacco as 90; the acreage of hay as 102; the average condition of timothy as 89; the product of clover as 100 and the average quality as 87; the average condition of pasture as 105; and the average condition of apples as 38.

Temperature and Rainfall for the Whole Country.

[From United States Weather-Crop Bulletins.]

Week ending August 2. — Week cooler than usual in New England, the middle Atlantic States, the lower lake region, also over the northern plateau and the Pacific coast. Throughout the central valleys, on the south Atlantic coast, the upper lake region and over the south-western districts and the greater part of California the week was warmer than usual. In the middle Atlantic States, over the greater part

of New England and the lake region and over local areas of limited extent elsewhere the rainfall exceeded the average. The actual fall over the middle Atlantic States and southern New England was very heavy, ranging from 1 to 5 inches; elsewhere the week was dry, there being extensive areas where there was no appreciable rainfall. Corn generally made favorable progress in the central valleys. Reports concerning spring wheat were generally favorable. The general outlook for tobacco was favorable, though injury resulted in Maryland and southern new England from excessive rains.

Week ending August 9. — Week warmer than usual throughout the central valleys, the upper lake region, the Gulf States and northern New England and also on the north Pacific coast. On the Atlantic coast the week averaged slightly cooler than usual. In southern California and over the central and northern Rocky Mountain region, including the upper Missouri valley, the week was also cooler than usual. The week was drier than usual in the west Gulf States, Ohio valley, middle Atlantic States and over the greater portion of New England and the lake region. More than the average amount of rain fell over the eastern Rocky Mountain slope, portions of the upper Missouri and upper Mississippi valleys, over central Arkansas and portions of the South Atlantic and east Gulf States, the lake region and southern New England. Corn continued to make favorable progress in the principal States. The week was not favorable to cotton, as a whole. Tobacco was generally doing well except in New England, where there was too much rain.

Week ending August 16. — The week was cooler than usual in the central valleys, over portions of the middle Rocky Mountain and plateau regions, in southern California and in portions of the middle Atlantic States and southern New England. The week was slightly warmer than usual in the south Atlantic and west Gulf States, in the central and northern Pacific coast districts, the lake region and in portions of the middle Atlantic States and southern New England. More than the average amount of rain fell over an area extending from central and western Texas northward to southern Nebraska, also over the extreme northern dis-

tricts from the upper Missouri valley eastward to New England. There was also excessive precipitation in the lower Mississippi valley and the coast districts of the east Gulf and south Atlantic States. Elsewhere the week was drier than usual. The weather conditions were not favorable in the principal corn States of the central valleys, being too cool and dry. Spring wheat harvest nearly finished. Tobacco cutting general in the more northerly States.

Week ending August 23. — Week warmer than usual over the plateau region and the Pacific States. Nearly normal conditions prevailed along the middle Atlantic and New England coasts. Throughout the lake region, central valleys and Gulf States and middle and southern Rocky Mountain slopes the week was cooler than usual. Both the maximum and minimum temperatures were unusually low. Very heavy rains fell during the week in the Gulf States, and more than average amounts fell over limited areas in the central valleys and southern New England. With these exceptions the week was drier than usual. The weather conditions of the week were very unfavorable to crops. Corn is generally maturing well, but needs warm weather. Tobacco cutting continues in the more northerly sections.

Special Telegraphic Reports.

[Weather Bureau, Boston.]

Week ending August 2. — New England. Boston: First part of week unseasonably cool, latter portion about normal; situation very serious, owing to almost daily rains; all fields too wet for working; much hay ruined; corn and potatoes suffering for sunshine; considerable loss on tobacco.

Week ending August 9. — New England. Boston: Slight improvement on favorable soils, owing to less rain and abundant sunshine; haying progressing rapidly, but many meadows are worthless; much corn cannot mature; oats harvested in generally poor condition; potatoes promise light yield; tobacco turning yellow on moist grounds.

Week ending August 16. — New England. Boston: Crops not past improvement are looking better; rain is too frequent for successful harvesting, and average for all crops will be low; corn backward; potato blight general; peaches

ripening prematurely; tobacco cutting commenced; general condition of crop poor.

Week ending August 23. — New England. Boston: Frequent showers and cool nights; narrow escape from frost on several mornings in interior; general outlook very discouraging; corn practically past recovery and much will be fit only for ensilage; potatoes almost a failure; tobacco slightly improved and cutting well advanced; fruit prospects fair.

Weather for August.

In its chief meteorological features the month of August was nearly normal, and it passed without many specially noteworthy phenomena of any kind. There were several days of unseasonably cool weather, and on the 21st the escape from light frosts in the interior sections was by a narrow margin. There was a remarkable paucity of so-called "dog-days," which was one of the agreeable features. Although there were some heavy rains, mostly local in character and occurring during thunder-storms, very little damage was sustained anywhere. The number of days with an appreciable amount of precipitation varied somewhat in different localities. In the eastern part of the State rain fell on an average of ten days, while in central and western portions the average was slightly greater. Thunder-storms were frequent, but not more so than naturally to be expected at this season.

The month opened with the effects of the phenomenal rains of July still very much in evidence. The first week gave warm and good growing weather, with less rain and abundant sunshine. The fair days greatly outnumbered the foul. A general improvement in crop conditions was noticed.

The second week was rather more unfavorable in all but the eastern and south-eastern counties. In the interior and the western counties showers were quite numerous. It was not a brilliant farm week in any except the eastern sections; there were only three days that brought even one-fourth of the usual amount of sunshine. In the eastern districts, the week, generally speaking, was favorable, as the precipitation was very small. Warm days prevailed all over the State, but the nights in the interior were cool.

The third week opened with thunder-storm conditions. The storms on the 15th were apparently the most general, and in certain localities they assumed violent proportions. The 18th again saw electrical disturbances in various parts of the State. In fact, the week brought overmuch rain, and the continued wet weather proved a serious drawback to farming operations. The day temperatures were practically normal and very even, ranging for the most part between 70° and 80°, but the night temperatures were low and unseasonable, falling below 50° on several occasions.

The week beginning with the 22d again witnessed thunder-storm conditions in the ascendancy, and the storms which occurred on this date kept good the character of the summer for unusual doings. The first steady and general rainstorm of the month was on the 24th, occasioned by a storm which moved up the Atlantic coast and centred off our southern coast on the morning of that day. It gave a large rainfall at Boston, in the course of which more than one-half inch fell in twenty minutes. The 23d and 24th were days of cool temperatures, but the remainder of the week was warm and seasonable, with very pleasant skies.

In the circular to correspondents returnable August 23 the following questions were asked : —

1. What is the condition of Indian corn?
2. What is the prospect for rowen, as compared with former years?
3. What is the prospect for late potatoes, and have you noticed blight or rot?
4. What is the condition of tobacco, and how does the crop compare with a normal crop?
5. What is the prospect for apples, pears, peaches, grapes and cranberries?
6. What is the condition of pasturage in your vicinity?
7. How have oats and barley compared with last year's crops?
8. Do your farmers pay much attention to poultry, and what proportion does the income from poultry products bear to that derived from the dairy?

Returns were received from 198 correspondents, from which the following summary has been made: —

Indian Corn.

Indian corn is backward, and will not be more than a three-fourths crop for the State as a whole; indeed, in many sections it is doubtful if it reaches that figure. On moist lands the crop will be in many cases an entire loss, and even on light fields the excessive moisture has worked much harm. It is off in color, and there is also much complaint that it is not earing out well. The condition is the best in the south-eastern portion of the State, where nearly a full crop is promised, but in the western counties there will be a very light crop.

Rowen.

Rowen will be the best crop for many years. The frequent rains, which have been injurious to many crops, have been particularly favorable to the growth of rowen. On some fields the bad weather delayed the cutting of the first crop until very late, and in these cases rowen will be a short crop; but, on the whole, more will be cut than in any recent year.

Late Potatoes.

Late potatoes will be a very poor crop indeed. Blight is general throughout the State, killing the vines and arresting the growth of the tubers, and rot is also generally prevalent. There is complaint that, even where fields do not show blight, the tubers are small and few and the general conditions most unfavorable. Many report the crop to be a complete failure, because of rot.

Tobacco.

Tobacco has suffered from the excessive rains to as great an extent as any crop, and will be very poor as a whole. There are some good fields, but they are the exception. It is mostly late, yellowish in color and small in growth. Cutting is later than usual, and was not, at the time of making returns, nearly completed.

Fruits.

Late apples do not promise very well, there being a falling off in condition since last month. Pears are unusually abundant. Peaches, though not a full crop, are yielding better than usual. There are some complaints of their rotting on the tree, which tends to reduce the yield in some orchards. Grapes are generally good, though there is some complaint of rot. Plums are generally a good crop, but are rotting on the tree somewhat. Cranberries do not promise well, returns from the section of commercial production indicating that there will not be more than half a crop.

Pasturage.

Pastures are everywhere in fine condition, the best ever reported for the time of year. The copious rains have kept feed green and growing, though there is a little complaint that its quality is not first class.

Oats and Barley.

These crops are hardly up to the average where they were allowed to mature the grain. There is considerable complaint of rust and lodging, also that the grain is not as full and plump as usual. As forage crops, however, they seem to have done very well indeed.

Poultry Keeping.

In the south-eastern portion of the State much attention is paid to poultry, and the income from it is nearly, if not quite, equal to that from the dairy. Elsewhere it seems to be rather a side issue, though its keeping is generally thought to be on the increase. In all sections there are some who make it a specialty. The general opinion seems to be that, with proper care, poultry keeping is more profitable than dairying, and that, even when allowed to take care of itself, poultry makes a good return on the capital invested. We cannot make an estimate as to the income from poultry compared to that from the dairy for the State as a whole, owing to the meagre and varied answers returned to this portion of the question.

NOTES OF CORRESPONDENTS.

(Returned to us August 23.)

BERKSHIRE COUNTY.

Sheffield (Dwight Andrews). — Corn is backward and is looking badly. Rowen never promised better. Potatoes are looking badly and I have noticed blight and rot. Tobacco is in full average condition, apples half a crop, pears good, peaches good and grapes good. Pasturage is in fine condition. Oats and barley are better crops than last year. Farmers are paying increased attention to poultry of late and think it pays as well as cows.

New Marlborough (L. P. Keyes). — Corn has made a fair growth during the past three weeks and the outlook is good. Early cut meadows have a large crop of rowen. Blight has struck potatoes and they have commenced to rot; tubers small and yield light. Apples half a crop; pears, peaches and grapes looking finely. Pastures are in good condition. Oats made a full average growth, but were damaged by wind and rain. Farmers are paying much more attention to poultry and find it pays much better than dairying.

Becket (W. H. Snow). — Indian corn is very late and is rusting. Rowen is good where the first crop was cut early. All potatoes show blight and there is some complaint of rot. Apples are poor, but pears are a full crop. Pasturage is in fine condition. Oats and barley are full average crops. Not many farmers pay much attention to poultry, but those that do find it profitable.

Lee (A. Bradley). — Indian corn is very near a full crop. Rowen promises considerably more than an average crop. Late potatoes promise to come within 10 per cent of a full crop. Apples are a three-fourths crop and pears an average crop. Pasturage is in very good condition. Oats and barley have been very poor crops. Not much attention is paid to poultry.

West Stockbridge (W. C. Spaulding). — Corn is backward, the season having been too wet. Rowen is more than an average in yield. The leaves and stalks of potatoes are withering, but there is as yet little complaint of rot. All fruit crops promise to be light.

Pasturage is in excellent condition. Oats and barley compare well with last year's crops. Not much attention is paid to poultry.

Hinsdale (S. M. Raymond). — Indian corn is in very poor condition. Rowen never looked better than at present. Potatoes promise a light crop; some blight and rot. Apples, pears, grapes and cranberries promise light crops. Pasturage never looked better and some are mowing their pastures. Oats and barley are good crops. No poultry raised except for home use. A great many farmers are not through haying yet and considerable grass will not be cut at all this year.

Hancock (C. H. Wells). — Corn is very backward. Rowen shows a much better yield than usual. The prospect is for less than half a crop of potatoes; they blighted badly and show some rot. Apples light, pears a good crop, no other fruits. Pasturage is in fine condition. Oats and barley are about three-fourths crops. There is very little poultry kept.

Cheshire (J. L. Northup). — Indian corn is backward. Rowen promises well where meadows were cut early. Blight and rot prevail in the potato fields throughout this section. Apples are a short crop, but pears are very abundant. Pastures are holding out remarkably. Oats are a fine crop; barley not raised. More poultry is being raised from year to year.

FRANKLIN COUNTY.

Rowe (J. F. Brown). — Corn is small and backward and in poor condition, but if the frosts hold off until late there will be a fair crop. Rowen is a large crop. Potatoes promise to be below the average in yield. All kinds of fruit will give but small yields. Pastures are in good condition and show plenty of feed. Oats and barley were good crops and were mostly cut for hay. We think that poultry if well cared for pays better than dairying.

Colrain (A. A. Smith). — Indian corn is in poor condition. The rowen crop is an increase over the usual crop. Potatoes promise a good yield; have noticed neither blight nor rot. All kinds of fruit will yield poorly. Pasturage is in good condition. Oats and barley were not as good crops as last year. Our farmers do not pay much attention to poultry.

Conway (J. C. Newhall). — Owing to the wet weather, the corn crop will be late and light. Where the land is not too wet, rowen will be heavy, far above the average. The potato crop promises to be light; I hear of both blight and rot. The tobacco crop has suffered from an excess of moisture, there being but few fields that do not have some small wet spots in them, but late

tobacco is doing well now. Very few apples, pears very plenty, other fruits about average. Pastures have been fine all the season. Oats and barley have not been average crops. Very few farmers keep more than enough poultry to supply their own wants.

Deerfield (Chas. Jones). — Corn is backward and not very well eared out. Rowen is good where the first crop was cut early. Potatoes are a small crop, with some blight and rot. Tobacco is a light crop and the wet weather has injured some pieces very much and all tobacco somewhat. Apples few, pears plenty, some peaches. Pastures were never better. Oats and barley are not as good crops as last year. Not much attention is paid to poultry.

Whately (Frank Dickinson). — Indian corn is poor and yellow. Rowen is a heavy crop. Potatoes are a medium crop, with very little blight. Tobacco is not over half a normal crop; too early to tell as to quality. Very few apples, other fruits good. Pastures are in good condition. Very few oats grown and no barley. Poultry is only kept for home use.

Montague (C. S. Raymond). — Indian corn will give 70 per cent of a crop. Rowen will be a much better crop than usual. Most potato fields show blight, but there is little rot. Tobacco is the poorest ever known, perhaps half a crop. All kinds of fruit will give light yields. Pasturage never was better. Oats made a fair growth, but the grain is light weight. Not much is done with poultry. The extremely wet season has been very bad for all crops, especially for corn and tobacco, and crops are very unsatisfactory on the whole.

Sunderland (J. M. J. Legate). — Corn is very late and not earing; I think it the poorest crop I ever knew. The rowen crop is very heavy, the only question being about the weather for securing it. Potatoes are a poor crop, rotting on heavy land and not setting on light. Tobacco is late and the crop as a general thing is very poor; there are some good pieces, but they are very few. Apples and pears look well; few peaches and grapes. Pastures show plenty of feed. Very few oats are raised and no barley. Our farmers pay little attention to poultry.

New Salem (Daniel Ballard). — Indian corn is much below the average. There is a large growth of rowen where the first crop was cut soon enough. Potatoes are a light crop; have noticed but little blight or rot. Apples a light or medium crop; pears, peaches, grapes and cranberries good. Pasturage is in excellent condition. Oats and barley are about the same as last year. Most of our farmers keep some poultry and a few make it a specialty.

HAMPSHIRE COUNTY.

Ware (J. H. Fletcher). — Indian corn is below an average crop. The prospect for rowen is excellent. Potatoes do not promise to be a very good crop. Apples, pears, peaches and grapes are very good in some parts of the town. Pasturage is in excellent condition. Oats and barley are not much raised except for hay and to feed green. Much attention is paid to poultry, and the income derived from poultry products is about equal to that from the dairy.

Prescott (W. F. Wendermuth). — Corn is poor and not earing well, with some rust, all owing to too much rain. Rowen is a good crop, probably from one-third to one-half more than usual. Potatoes will be small, unripe and a light yield, and are badly blighted. Apples fair for an off year, pears fair, peaches one-third crop, grapes rotting badly. Pastures are in very good condition. Oats and barley are about two-thirds crops, the late ones being nearly spoiled by rust. Poultry is growing in favor, and the proportion of the income derived from it to that derived from the dairy is about one to four.

Amherst (F. S. Cooley). — Corn is good only where drainage is good, a large part being almost a failure. Rowen is better than usual on early cut mowings. Potatoes promise poorly and rot is very prevalent. Tobacco has generally suffered from excessive rainfall. Pasturage is unusually plentiful. From one-tenth to one-fifth of the income on many local farms comes from the farm poultry.

Hatfield (Thaddeus Graves). — Corn is injured by the rains, but is improving, and with sun will be a good crop. Rowen is better than usual. Potatoes are not in good condition and both blight and rot have appeared. Tobacco was injured by rain and is about half a crop. Pears and grapes are good crops, but apples are scarce. Pastures are in better condition than usual. Oats are about an average crop. No attention is paid to poultry.

Northampton (D. A. Horton). — Indian corn is very poor and will not average more than one-third of a crop. Rowen is very good. Both blight and rot on potatoes are reported. The acreage of tobacco is about the same as in 1896, but the yield is not more than two-thirds as great, if it is more than one-half. All fruits promise full average crops. Pasturage is in very good condition. No barley and but few oats are raised.

Southampton (C. B. Lyman). — Indian corn does not promise more than half a crop. Rowen is the largest crop for years. Potatoes will be a light crop; blight is general and rot has showed

itself in some localities. Tobacco cutting has commenced and the crop will be light, as there has been too much moisture. Apples not a large crop, pears good, a few peaches and lots of grapes. Pastures were never better at this time of year. Oats are not nearly as good a crop as last year. Very little attention is paid to poultry. Nearly all crops have suffered from the excessive rains, which have kept the ground full of water and have drowned out many low meadows.

Plainfield (S. W. Clark). — Indian corn is very backward, because of too much rain. Rowen is very, very good. Potatoes are rather poor and are best on dry land. Apples are a fair crop for an off year, other fruits good. Pasturage is in the best condition ever known for the time of year. Oats and barley are about average crops. Not much attention is paid to poultry and the income derived from it is very light.

HAMPDEN COUNTY.

Tolland (E. M. Moore). — Corn is later than usual and a good many pieces will not get ripe. The rowen crop is larger than for a number of years. Late potatoes will be a poor crop, as blight and rot have struck most pieces. Apples a small crop, grapes and cranberries plenty. There is plenty of feed in pastures, but it lacks fattening qualities. Oats and barley are not as good as usual. The continuous wet weather has done great damage to all kinds of crops.

Southwick (L. A. Fowler). — Indian corn is not quite up to the average. Rowen is more than an average crop. Late potatoes are very poor and both blight and rot have appeared. There are very few average crops of tobacco in town. The prospect for all kinds of fruits is quite good. Pasturage is in good condition. Oats and barley are about as last year. Most of our farmers keep poultry, but none extensively.

Westfield (C. F. Fowler). — Corn has made a very poor growth and has very few ears of any size. Rowen will be a heavy crop. Potatoes will be a light crop, having suffered from blight; grubs and wire worms are working them badly. Tobacco has had too much moisture, many pieces being entirely ruined. Apples a light crop, pears medium, peaches always scarce, grapes fairly good. Pastures have held out well, but the grass is not very nutritious. Increased attention is being given to poultry, especially by those who have but little land.

West Springfield (N. T. Smith). — Indian corn is the worst crop I ever knew. Rowen is an unusually large crop where the

first crop was cut in season. Potatoes are a light yield, blight general and rot bad on low wet land. The best pieces of tobacco have a yellow tinge and all have suffered from excessive moisture. All kinds of fruit promise fairly, with the exception of apples. Pasturage is remarkably good. Oats and barley are about as last season, but it is very difficult to harvest them. Little attention is paid to poultry.

Longmeadow (W. F. Emerson). — Corn has improved, but is late. The prospect is that there will be less rowen than usual, because so much of the first crop was cut late. Potatoes show some rot and the general condition of the crop is not good. Tobacco is a small growth and poor color. Fruit of all kinds is better than usual. Pasturage is in good condition. Not much attention is paid to poultry, and the income as compared to that from the dairy is small.

Hampden (J. N. Isham). — Indian corn is about two weeks late and is apparently about two-thirds of a crop. Rowen is better than it has been for years. Late potatoes are a short crop, blight coming in the middle of the month. Tobacco has fared hardly and some of the best pieces were nearly destroyed by hail. Winter apples few, fall apples plenty; pears and grapes good. Pastures are as green as in June. Oats were a heavy crop, lodged badly and some were injured in curing. Poultry is generally well cared for, and the income derived from it is one-tenth that from the dairy.

Monson (W. M. Tucker). — Corn is growing very fast and is looking well where the ground is not too wet. Rowen is heavy on early cut pieces, but many mowings were cut too ate. Potatoes have looked well until within a few days; very small yield, turning brown, some rot. Early apples fair, late varieties scarce; pears, peaches and grapes plenty. Pastures look well and stock is thriving. Oats are a good crop, with not quite as heavy straw as last year and some rust. Not many handle poultry extensively, and I should judge the income derived from it to be less than 20 per cent of that from the dairy.

WORCESTER COUNTY.

Southbridge (G. L. Clemence). — Indian corn is in poor condition. There is more rowen this year than in the last five combined. Potatoes have blighted and are small and poor. Apples scarce, pears very plenty, peaches and grapes good. Pasturage is in the best condition that I ever saw. Oats rusted badly and were mostly cut for hay.

Dudley (J. J. Gilles). — Corn has made a rank growth, but is not earing very well. Rowen was never more promising. Potatoes are rotting badly. No peaches or apples, pears a fair crop. Pasturage is in excellent condition. Oats and barley both made heavy yields. From 25 to 100 hens are kept by individual farmers, and no special effort is made to obtain more than average results.

Rutland (L. S. Dudley). — Indian corn is rather backward. Fields that were cut early will be heavy with rowen. Potatoes, unless early, seem to be small and few in the hill. Pasturage is in good condition. Owing to wet weather, oats did not grow as well as last year. Few pay much attention to poultry.

Hubbardston (C. C. Colby). — Indian corn is very backward and much below the average Rowen is the largest crop for years. Potatoes are small and many farmers report that they are rotting badly. Not many apples, but an abundant crop of pears and grapes. Pasturage is in excellent condition. Oats and barley made large crops, but the rains lodged them badly and most of them were harvested in poor condition. Very little attention is paid to poultry.

Templeton (Lucien Gove). — As a whole, the condition of the corn crop is the poorest for many years. Rowen is better than for several years. Apples less than half a crop, pears fair, peaches rotting on trees, thus reducing the crop, grapes below average. Pastures are in very good condition for the season of the year. Oats and barley are equal to last season's crop for forage, but the grain is deficient, as it did not fill out plump. Poultry is a side industry, though on the increase; perhaps the income derived from it is 25 per cent that from the dairy.

Royalston (C. A. Stimson). — Indian corn is very late and some of it will have to be put into the silo. Rowen is a larger crop than for years. Potatoes are about one-third of a crop; blight has appeared, but there is little rot. No winter apples to speak of, pears good, also cranberries. Pastures are in the best condition for years. Oats and barley are larger crops than last year. Only small flocks of poultry are kept in this vicinity.

Fitchburg (Jabez Fisher). — Most corn shows poor condition, though some fields look well. Rowen is a good crop where the first crop was cut seasonably. Blight is quite prevalent on potatoes, with some rot; prospect poor. Apples very poor, pears unusually good, peaches and grapes good; but these are, together with the plums, showing considerable rot. Pasturage is in very good condition. In many cases poultry gives more profit than dairying, and probably a higher per cent is generally realized on the capital invested.

Harvard (J. S. Preston). — Corn is a short crop and a great deal of it is rather yellow colored. Rowen is better than it has been for a number of years. Potatoes have run to vines; not much blight, but considerable rot. Apples a light crop, pears good, peaches a large crop, grapes good and cranberries below average. Pastures are in the best condition for many years. Oats are grown for early cutting and the crop was large. All our farmers keep some hens, usually from 50 to 200.

Worcester (H. R. Kinney). — Indian corn looks fairly well, but is very late. Rowen is remarkably good. Potatoes are poor, with a great deal of blight and some rot. Apples will be a very light crop, of poor quality; other fruits good. Pasturage is in excellent condition for this season of the year. Oats and barley were mostly cut green and were badly damaged by the weather. All our farmers keep some poultry and as a rule the smaller ones keep the most of it.

Northborough (J. K. Mills). — Corn is good on uplands, but on low land it will not amount to much except for fodder. Rowen is a good crop. Potatoes are not more than half a crop and both blight and rot have appeared. Apples are half a crop; pears, peaches and grapes are full crops. Pasturage is in good condition. Oats and barley are about as last year. Nearly every farmer keeps some poultry.

Sutton (O. P. Johnson). — Indian corn is in poor condition. Rowen promises to be first rate. Potatoes have blighted badly and show some rot. Apples are a poor crop, but other fruits are good. Pasturage is in good condition. Oats and barley are not much raised for grain. A few pay attention to poultry with very good results.

Blackstone (L. R. Daniels). — Indian corn is thrifty, but a little later than in dry seasons. The rainy season has insured a heavy crop of rowen. Very few late potatoes are grown; no rot to speak of. No winter apples, few peaches; pears, grapes and cranberries good. Pasturage is as good as it can well be. Oats and barley are fully equal to last year's crops. Most farmers, and others not farmers, give much attention to poultry, as its products can always be sold at some price, which is not the case with dairy products. The general opinion is that the profit from 20 to 25 fowls is equal to that from one good cow.

MIDDLESEX COUNTY.

Stow (G. W. Bradley). — Indian corn is looking well, but needs warm weather. Rowen looks better than usual. Potatoes

are turning out poorly and rotting quite badly. Apples scarce, pears and peaches plenty, not many grapes or cranberries. Pasturage is very good and will probably hold out well. Oats and barley are about the same as last year. Not much attention is paid to poultry.

Westford (Arthur Wright). — Corn is very backward, but silo corn is large. Rowen promises to be an average crop. Potatoes are a light crop. Apples are scarce and peaches are rotting on account of wet weather. Pasturage is in good condition. Oats and barley are about average crops. Most of our farmers keep some poultry.

Townsend (G. A. Wilder). — Indian corn is an average crop. Rowen is a third heavier than usual. Potatoes are an average crop, with no rot to speak of. Apples good for an off year, pears average, grapes good and cranberries fair. Peaches started the season with the prospect of a heavy crop, but heat and wet weather have caused them to rot so badly that some orchards will lose three-quarters of their crop. Oats and barley are about average, but not much grown. Pastures are in good condition. Much attention is paid to poultry, but the dairy leads in relative income by 25 per cent.

Tewksbury (G. E. Crosby). — Indian corn is fairly good, though but little grown. There is more rowen than usual, but I doubt if the quality is as good. Potatoes are a small crop, with blight in many cases and some rot. Very few apples; pears, peaches and grapes fair; few cranberries. There is plenty of feed in the pastures, but it is evidently not of the best quality. Oats and barley are not as good as usual and the late cut is rusting badly. I do not think farmers pay as much attention to poultry as they ought. The average farmer keeps a few hens, as he did twenty-five years ago.

Carlisle (J. E. Carr). — Corn is backward, but is earing well. Rowen is a good crop. Potatoes are blighting and rotting badly. Very few apples, peaches rotting on the trees, pears plenty, grapes and cranberries looking well. Pasturage is in the very best condition. Oats and barley are about average crops. About 25 per cent as much income is derived from poultry as from the dairy.

Concord (Wm. H. Hunt). — Corn is still backward. There will be a fine crop of rowen. Potatoes are a small crop, with blight and some rot. Apples a light crop; pears, peaches and grapes good. Pasturage is in better condition than usual. Oats and barley are fair crops. All farmers keep some hens, but the income derived from them is small when compared with that from

the dairy. The season has been so wet that very little meadow grass has been cut.

Woburn (W. H. Bartlett). — Corn is late, but will be all right before frost, unless it comes unusually early. Some fields of potatoes yield very well, while others are hardly worth digging; no blight or rot. Squashes will be a light crop, the high winds having twisted the vines beyond recovery. Tomatoes are ripening very slowly, some fields blighting and others looking very well. Cabbage stump-footed badly and worms have done some damage. Cucumbers are a light yield. Beets, turnips and carrots are good. Apples few and poor, very few peaches, pears small and knurly, plums a full yield but are rotting on the trees. Much attention is paid to poultry and it is increasing. To sum up; it has been a cool, wet season; early crops, good yields and poor prices; late crops, light yields and better prices. So far, August prices have been the best for fifteen years for market gardeners.

Winchester (Marshall Symmes). — Late-planted corn is much better than early. Rowen will certainly be much heavier than for years. Potatoes are blighted, some rot, crop surely very light. Very few apples, pears heavy crop, peaches fair. Pasturage is in fine condition. Very little poultry is raised. Owing to cold and continued wet weather, the squash crop will be a very small one.

Framingham (H. S. Whittemore). — At the present time the prospect is good for a fair crop of Indian corn. There is prospect of a good crop of rowen. Potatoes are a poor crop; blight is universal and there is some rot. Very few apples, pears plenty, some peaches, grapes a small crop. Pasturage was never better at this season of the year. Oats were good and were mostly cut for hay. Barley not as good as some years. Not much interest is taken in poultry except by a few. Onions have blighted and will be a poor crop.

ESSEX COUNTY.

Amesbury (F. W. Sargent). — Indian corn is late and not likely to come to maturity. Where the first crop was cut early there is the most rowen I have ever seen. Potatoes are a poor crop, with considerable blight and some rot. Apples scarce, pears plenty, some peaches and a few grapes. Pasturage is in the best condition ever known in August. Oats and barley are about average crops. On most farms poultry is a side issue and the proportion of profit hard to calculate.

West Newbury (J. C. Tarleton). — Corn is backward and not n as good condition as last year. Rowen promises well. Potatoes

are blighting badly and turning black, but there is no rot as yet. Very few apples and peaches; pears, grapes and cranberries very fine. Pastures are in very good condition. Farmers do not do much with poultry.

North Andover (Peter Holt, Jr). — Indian corn is small and late. There is a larger crop of rowen than we have seen for years. Potatoes are badly blighted and are rotting. No apples, a full crop of pears, a few peaches, an abundant crop of grapes, cranberries a full crop though a little late. Pasturage is in good condition. Oats and barley are better crops than last year. Farmers pay little attention to poultry, except those who make a specialty of it.

Ipswich (O. C. Smith). — Indian corn is a fair crop, perhaps 10 per cent below average. There is the most rowen we have ever had. Many potatoes are small and some are rotting, though the vines are green. No winter apples, pears in abundance, other fruits average. Pasturage was never better at this season. Oats and barley are much larger and heavier than last year; mostly raised for fodder. The majority do not pay much attention to poultry, though some get much of their income from it. Many meadows are not cut yet on account of the excessive rains.

Hamilton (Alvin Smith). — Corn looks very slim. Rowen is very good. Potatoes are very good and there is not much rot. There are no apples, but pears are a good crop. Pastures are looking well. Oats and barley are light crops. Not much attention is paid to poultry. We have had a very bad season for securing hay.

Wenham (N. P. Perkins). — Indian corn is backward and there was not as much as usual planted. More acres of rowen will be cut than usual, but I do not think the crop is very heavy. Potatoes vary, some fields being good and others poor, and they are rotting quite badly. No apples, pears and peaches a fair crop, a few cranberries in some localities. Pasturage has been very good all summer, but is failing now and cows are falling off in yield of milk. Oats and barley are mostly cut for fodder. Not much attention is paid to poultry, but the income derived from it is one-fourth that from the dairy.

NORFOLK COUNTY.

Stoughton (C. F. Curtis). — Corn is in extra good condition, but a little warmer weather is needed. On early cut land rowen is extra good and the yield will be large. Pears and grapes are a large yield. Oats and barley are not grown for grain. Pasturage

is always poor here, as the land and grasses are run out and nothing done to improve them. Poultry is only a small side issue.

Norfolk (G. E. Holbrook). — It has been too cold and wet for Indian corn and the crop is very backward. Rowen yields heavily. About every field of potatoes shows the blight and they are rotting. All fruits are good except apples. Pastures were never in better condition. Oats and barley are only raised for fodder. Poultry and eggs form a large per cent of the income of a good many farmers.

Medfield (G. R. Chase). — Indian corn is backward. Rowen was never better than now. There is no blight or rot, but the prospect for potatoes is below the average. Apples poor, pears good, no peaches, grapes and cranberries good. Pasturage has rarely been as good as now. Oats and barley were good average crops, but were injured by the weather. Not much attention is paid to poultry, but it is found to pay better for capital invested than almost any other line.

Millis (E. F. Richardson). — Corn is in fine condition. Rowen promises to be better than the average. Potatoes are a poor crop and blight and rot are both prevalent. Pears, peaches, grapes and cranberries are good and apples poor. Pastures are in good condition. Oats and barley are better crops than last year. Very few farmers have poultry.

Medway (M. Morse). — Corn is in poor condition. Rowen promises to be a good crop. Potatoes are a small crop and are all blighted and rotting. Apples poor, pears good, peaches good and grapes fair. Pasturage is in very good condition. Oats and barley are grown only for fodder, but made a good growth. Excessive moisture has caused plums to rot badly and blackberries and raspberries to be soft. It also deteriorates the quality of all fruits.

Bellingham (J. J. O'Sullivan). — Indian corn looks well so far. Rowen is better than for some years. There is some rot on potatoes and blight is commencing. Apples, pears and peaches are poor; grapes and cranberries good. Pasturage is in very good condition. Oats rather better than last year and barley not quite as good. The income derived from poultry is from one-sixth to one-eighth that derived from the dairy.

BRISTOL COUNTY.

Easton (H. M. Thompson). — Corn is in promising condition. Rowen will be a larger yield than usual. Potatoes are rotting to a certain extent and are being dug to save the crop. No apples, all other fruits promise well. Pasturage is in fair condition. Oats

and barley are better than last year. Considerable attention is paid by the farmers to poultry, hens being the favorite kind, with some few ducks being kept. Beside this, there is quite a business carried on by those who make poultry a specialty.

Norton (W. A. Lane). — Corn is in good condition now. Rowen is more than an average crop. Potatoes are a good crop; some fields have blighted. No apples; pears, grapes and cranberries plenty. Pastures are in good condition. Oats and barley are better than last year. I should say the income from poultry is greater than that from the dairy. French turnips are looking finely.

Berkeley (R. H. Babbitt). — Corn planted early looks well, but that planted late will be poor. Rowen is more than an average crop. Early planted potatoes are very good, late ones blighting and rotting. Apples poor, pears good, peaches fair, grapes good and cranberries average. Pasturage is very good. Barley is a good crop and oats very heavy. The income from poultry is fully one-third that from the dairy.

Somerset (Joseph Gibbs). — Indian corn promises a full crop. Rowen is an extra good crop. Late potatoes are rotting. Apples are a very light crop, pears fairly good, peaches a good crop. Pastures are in good condition. Oats and barley are full average crops. Many farmers are increasing their poultry business, and find that it pays much better than most branches of farming. Farmers are realizing better prices for their products this year.

Westport (A. S. Sherman). — Indian corn never looked better. There has not been such a crop of rowen for many years. Potatoes are turning out well and show very little rot. Apples scarce, pears very plenty, peaches better than an average, grapes abundant. Feed in pastures was never more abundant. Oats and barley are better crops than last year. The production of poultry is on the increase. Turnips and cabbage are making rapid growth, with prospect of large crops.

Fairhaven (F. C. Lyon). — Corn is in good condition. Rowen will exceed the average crop of former years. Late potatoes have blighted and are rotting very badly. Apples will be a small crop, pears small, peaches fair and grapes small. Pasturage is showing signs of heavy feeding, but the color is good yet. Poultry products are increasing with prices decreasing.

PLYMOUTH COUNTY.

Brockton (Davis Copeland). — Indian corn is good, but a little late. Rowen is 50 per cent more than an average crop. There

is some blight on potatoes. Apples and peaches are poor and pears fair. Pastures are in good condition. Oats and barley are not raised for grain.

Bridgewater (R. Cass). — Corn is late and has not eared as heavily as common. Rowen is full 50 per cent heavier than usual. Late potatoes are lighter than was expected, with some blight and rot. Apples poor, pears plenty; some peaches, grapes and cranberries. Pasturage is generally good. Oats and barley are heavier than last year. Our farmers simply keep a few hens for home use, with an occasional sale, but several in this locality make a business of poultry.

Pembroke (Nathaniel Morton). — Indian corn is a fairly good crop, with small acreage. Rowen is better than usual, owing to frequent rains. There is some blight on potatoes, but it is not serious. No apples, pears abundant, few peaches, grapes medium and cranberries good. Pasturage is in very good condition. The income from poultry is greater than that from the dairy.

Plympton (Jacob Parker). — Indian corn is in good condition and is a heavy crop. There will be more rowen than in former years. The potato crop is a failure. There is a great cranberry crop. Pasturage is in good condition. More poultry is raised than anything else, and the income from it is greater than that from any other source.

Lakeville (Elbridge Cushman). — Corn is a good crop and fully up to the average for the season. Rowen never was better. Potatoes good in yield and quality, but just commencing to rot. No apples, pears good, peaches fair, grapes good and cranberries average. Pastures are in very good condition indeed. Oats and barley are good crops. The income from poultry is greater than that from the dairy.

Wareham (A. B. Savary). — Indian corn is in good condition. Rowen is more than an average crop. Late potatoes look well. Few apples, pears or peaches; grapes good and cranberries fair. Pasturage is in excellent condition. There is not much attention paid to poultry, though there is an excellent market during the summer months for both chickens and eggs. Winter squashes are suffering from the squash-vine borer.

BARNSTABLE COUNTY.

Sandwich (J. R. Holway). — Indian corn is in excellent condition. Rowen is more than an average crop. Potatoes are a fair crop, with but little blight and no rot. Apples and grapes poor, pears and peaches fair, cranberries about 50 per cent of last year's

crop. Pasturage is in average condition. Oats and barley are heavier crops than last year. Much attention is paid to poultry, and the income derived from it bears the proportion of about two to one to that derived from the dairy.

Mashpee (W. F. Hammond). — Corn is below the average. The prospect for rowen is above the average. Potatoes will be a two-thirds crop; there is blight, but no rot. Apples and pears are a quarter of a crop, peaches a failure, grapes and cranberries half a crop. Pasturage is in very good condition. Oats are a full crop. Poultry raising is not carried on to any extent.

Barnstable (John Bursley). — Corn is a good crop for the season. Rowen is an average crop. Potato tops look well and there is but little blight. Cranberries, apples, pears and peaches light crop; grapes good. Pastures are in good condition. Oats and barley are about three-fourths of last year's crop. The poultry income is nearly or quite equal to that from the dairy.

Brewster (J. H. Clark). — Indian corn is in very good condition. Rowen is better than usual. The potato crop is light in this vicinity. Very few apples and peaches, pears and grapes look fairly well, cranberries about one-half of last year's crop. Pasturage is in excellent condition. Scarcely any barley raised, but oats better than last year. Not much attention is paid to poultry raising.

Orleans (John Kenrick). — Corn has made good growth the last few weeks and is very promising. Rowen promises a full average crop. No apples, pears good, peaches and grapes small crops and cranberries half an average crop. Pasturage is in good condition for the last of the season. A good deal of attention is paid to poultry, and I think the income derived from it equal to that from the dairy.

Truro (D. E. Paine). — No corn of any account raised. The prospect for rowen is good and it compares favorably with other years. Potatoes promise fairly and have not rotted. All kinds of fruits are below the average. Pastures are in good condition. But few if any oats or barley raised. Only small flocks of poultry are kept.

DUKES COUNTY.

West Tisbury (Geo. Hunt Luce). — Indian corn is looking well, but there is some complaint of its not earing well. Rowen is more than an average crop. Late potatoes are below the average and there is some blight and rot. Apples are not as good as was expected, but grapes are a good crop. Pasturage is above the average in condition. Oats are not as heavy as last year.

Poultry raising is on the increase, and the poultry income is much greater than that from the dairy.

NANTUCKET COUNTY.

Nantucket (Chas. W. Gardner). — Indian corn is in fair condition, but is late. Rowen is very much better than for several years. Some fields of potatoes have very good crops, while others are failures. Cranberries are looking finely. Pastures are in very good condition. Oats and barley are much better in quantity and quality than last year. Many farmers keep large flocks of fowls, and all speak well of their returns. My own experience is that they pay me better in proportion to the expense and labor than do my cows.

BULLETIN OF

MASSACHUSETTS BOARD OF AGRICULTURE.

SYSTEMATIC FEEDING AND WATERING AS A PREVENTATIVE OF DISEASE IN HORSES.

By Prof. Jas. B. Paige, *Veterinarian to the Board.*

I propose in this short paper to discuss very briefly a few of the more important points suggested by the above title. My idea is to show how many diseases of horses are referable to a faulty system of feeding or watering, or both combined, and how they may be prevented by the application of the principles that should guide us in this matter.

The subject is by no means a new one, numerous articles relative to it having already appeared in our books and agricultural papers; but it would seem, from the great number of erroneous ideas which people entertain and put into practice in this connection, that the information imparted has not been productive of much good. No one appreciates this more than the practising veterinarian, who can trace, in a large majority of the cases of intestinal disease, founder, etc., which he is called to treat, the cause of the same to some fault either in quantity, quality or other condition of the food used, or to some condition of the animal when the food or water was given. From my own observations I am led to conclude that it is not so much on account of ignorance of the principles that should guide us in the feeding of horses, so as to prevent the occurrence of disease, as it is on account of failure to put the principles into practice. Many people are thoughtless or negligent about these things. This applies more especially in rural districts. It frequently happens that a fatal

attack of colic is the result of thoughtlessly giving a horse a seemingly small quantity of green grass in early spring time, when he is not accustomed to it, or of carelessly throwing a few small potatoes or specked apples into his manger when they are removed from the cellar at the close of winter. Excluding fatalities from contagious diseases and from accidents and complications, I think it a conservative estimate that four-fifths of all deaths among horses in rural districts are traceable to mistakes either in feeding or watering; and, considering that the majority of such fatalities are preventable by the exercise of care in feeding or watering, the subject under discussion is certainly deserving of most careful consideration.

Smith, in his work on "Veterinary Hygiene," says, regarding this subject: "The connection between food and disease as cause and effect is well known. Throughout the whole category of disease-producing causes there is no simple factor which exercises so much influence. The reason of this is not difficult to seek. Men feed their animals as they feed themselves. They are either overfed with highly nutritious food, or underfed with material of bad quality; or the food given them is at irregular intervals, badly prepared, or unsuited to the digestive organs of the animal. Another reason for the great importance of the subject of food in relation to disease of the lower animals is that it is one of the three tangible causes we can handle."

The following is a partial list of the diseases of horses which may arise wholly or in part in connection with an irrational system of alimentation: abortion, heaves, swelled legs, lymphangitis, laminitis, scratches, stomatitis, ptyalism, glossitis, urticaria, choking, impaction of the stomach, gastric tympanitis, gastritis, stomach rupture, spasmodic and flatulent colic, intestinal impaction, enteritis, constipation, diarrhœa, dysentery, alimentary calculi, hepatitis and *immobilité*. Of diseases of the urinary system may be mentioned nephritis, hæmaglobinuria, hæmaturia and diabetes.

The subject may be viewed from two different stand-points, — the scientific and the practical.

Scientific investigation in physiology and chemistry have during recent years brought out many important points relating to the most economical and satisfactory methods of feeding our farm amimals for specific purposes. Among other things, they have taught us that the animal body is composed of organic and inorganic substances, the former consisting of nitrogenous and non-nitrogenous constituents, the first particularly abundant in the muscles and similar tissues, while the non-nitrogenous substances exist largely as fats. Of the inorganic constituents we have the

various salts which, taken collectively, form the ash. The salts consist of lime, potash, soda, magnesia, etc.

A chemical analysis of plants shows that we have in them compounds whose composition corresponds very closely to similar substances found in the animal body. We find that there are in plants both organic and inorganic compounds; protein, fats and carbohydrates belong to the former, the various salts to the latter.

Through our study of animal physiology and chemistry we have learned of the action of the various digestive ferments of the body upon the plant constituents, and now know that the digestive proteins, fats and carbohydrates of plant origin are used in the animal body for the production of muscle, bone, milk, heat, energy, etc.

In consideration of what has been learned by experimental research in physiology and allied sciences regarding the composition of animal and plant tissue and their products, the processes of digestion, assimilation, etc., one might surmise that it would be possible to compound a food ration which should supply all the various elements in the proper proportion necessary for the complete nourishment of the different tissues of the animal body. Such, however, is not the case. In order to keep the animal organism in a normal, healthful condition, we need to supply more than what is shown to exist by chemical analysis in the various tissues. A certain mechanical condition of the food is requisite, as well as a sufficiency of bulk. The digestibility of the food, the quality, etc., have to be taken into account, and we must not forget that anatomical variations have their influence in connection with proper feeding. In other words, to obtain certain results in the feeding of farm animals, we must bring into play the sum total of our knowledge of the chemistry and physiology of feeding, together with those practical points learned by experience. This applies in the case of all farm animals, it makes no difference whether we feed for growth, milk, beef, pork, mutton, or, as in the horse, for force and energy. In any case we have to bear in mind that in order to secure the best results in any particular direction we must so treat our animals that perfect health shall be maintained. This is where knowledge obtained by practical experience applies, and in this part of the subject we are particularly interested. The study of the scientific investigations of questions relating to feeds and feeding is interesting and profitable. The reader is referred to various books and agricultural experiment station bulletins for information concerning it. Unfortunately, there is a scarcity of literature upon the subject of the hygiene of feeding. What information we possess has been gained largely

through the channels of practical experience, and frequently we have paid dearly for it.

One of the most important factors to be taken into account in the feeding and watering of horses is the anatomical arrangement of the digestive organs. The relative size of the stomach of the horse, as compared with that of the other domestic animals, is small. When distended, it has a capacity of twenty-five or thirty pints. In case normal digestion is taking place, it rarely contains more than seventeen or eighteen pints. The arrangement of the mucous membrane is peculiar, in that it is sharply divided into two parts, the cuticular portion being continuous with the mucous lining of the œsophagus. The villous membrane lines the right half of the stomach, extending to the pyloric opening; the left portion is preparatory in its function. The membrane of the right half contains the glands which secrete the digestive juices; the right half is the digestive portion. Stomach digestion in the horse goes on very rapidly. The length of time required to digest a food varies with its chemical composition, mechanical condition, bulk, etc. As a rule, it may be stated that the more nitrogenous a food the longer it remains in the stomach. It may happen that the nitrogenous food may remain in the stomach but a short time, being forced into the intestines by the ingestion of large quantities of non-nitrogenous material; for example, corn, oats or other nitrogenous grains ordinarily remain in the stomach longer than hay, but by feeding grains first and hay in large quantities afterwards the grains may be forced into the intestines undigested.

Colin's and Smith's experiments with reference to stomach digestion of hay and oats are interesting and instructive. They found that when small amounts of food are given after fasting they pass directly to the right side of the stomach, becoming in a short time thoroughly mixed with and acted upon by the gastric secretions. As soon after feeding begins as the stomach attains a certain size, the ingesta passes out into the intestines as rapidly as it comes in through the œsophagus. This occurs regardless of the composition or condition of the food mass. As soon as the animal stops eating, the food passes into the intestines more slowly; it continues to pass out, however, until the stomach becomes considerably reduced in size, then the stomach empties itself very slowly. It would seem that nature intended that a portion of the ingesta should remain in the stomach to act as ballast. It requires from twelve to fifteen hours for the stomach to completely empty itself. It has been found by experiment upon horses that the ingesta arranges itself in layers in the stomach in the order in which it is taken in, that arriving first going into the pyloric portion of

the organ. These layers remain quite distinct during the greater part of the time that active digestion is going on, complete mixing of the contents occurring only at the pylorus.

By the ingestion of large quantities or water soon after eating the distinct-layer arrangement of the food is broken up and much undigested material washed into the intestines. As soon as material passes from the stomach into the intestines it comes in contact with the secretions from the liver, pancreas and intestinal glands. These secretions have both a mechanical and chemical or digestive action. The contents of the small intestines are distinctly fluid. After passing from the small into the large intestines the material is rendered more firm in consistence by absorption of fluid from it. It is also probable that considerable cellulose is digested in the larger bowels during the slow passage of the ingesta through them.

In order that we may so feed our horses as to prevent disease, aside from the anatomical arrangement of the digestive organs, we must take into account the nature of the work required, as well as individual peculiarities of different animals. The feeding of a horse for slow farm work must necessarily differ from that of the one used wholly upon the road or track for fast work. In the former a large, well-filled abdomen does not interfere with its performing the work required of it, consequently there is little objection to giving a horse used for slow work liberal quantities of bulky food. The same food given a race horse would produce such a distension of the stomach and intestines that free and easy action of the respiratory organs would be prevented, and in consequence the horse rendered useless for fast work. Race horses require a more concentrated and easily digested food than it is necessary or economical to supply our slow-working animals.

Individual animals possessing certain constitutional peculiarities are frequently very susceptible in respect to the action of different kinds of feeds or different methods of feeding and watering. Such animals are usually nervous and excitable, are long-legged, narrow-chested, straight-ribbed and small-barrelled. They are often-times designated "bad thrivers," on account of the difficulty in feeding them so as to keep them in good condition. Such individuals are liable to attacks of indigestion, diarrhœa, colic, etc., upon the slightest change of feed, or irregularity in feeding or watering.

Bearing in mind some of the general principles which have been briefly referred to, we may consider in detail some of the methods of feeding and watering, commonly practised, which are most productive of disease.

First we notice the effect of an excess of food. In this we must consider the horse as a machine, which has a certain limited capacity for converting so much raw material into a finished product. We supply the horse with hay and grain, and expect in return for our outlay a definite amount of energy. Within certain limits the quantity of the product does not depend so much upon what we supply as upon the capacity of the organism to convert what is given from one form into another. A horse can take in, digest, assimilate and appropriate only a limited amount of material. If more than this definite quantity be taken, the organism must of necessity become taxed beyond its powers; *e. g.*, if more food is eaten than can be digested and absorbed, it accumulates in the intestines, acting as foreign material, produces irritation, causing colic or a similar disorder. If, on the other hand, more food is taken, digested and absorbed than can be appropriated by the different tissues, a condition of plethora results, in which the circulatory system or the lymphatic system becomes overloaded with nitrogenous or other constituents. If overloading of the lymphatic system of the extremities occurs, we have lymphangitis, or "Monday morning disease," produced.

By many people a mistake is made in that they believe it possible, by allowing excessive quantities of rich food, to keep an overworked animal in good condition. If we investigate this subject we shall see that such is not the case. Work brings about rapid destruction of the tissue. The material to repair or replace the destroyed tissue is contained in the food of the animal. It must be brought into a suitable condition by digestion before it can be appropriated by the tissue cells. The digestive organs are capable of a definite amount of work, and an excessive destruction of tissue over what can be replaced through digested food must remain, for a time at least, unrepaired. The undigested residue of the excessive quantity of food must remain in the intestinal tract, and it may become the cause of disease. In case of overworked animals, the richer, more concentrated and easily digested the food, the greater the amount appropriated by the tissues. At the same time, it should be remembered that the retention in the intestines of undigested material rich in nitrogenous constituents is attended with more danger than in case of retention of less rich food. An over-feed of grain may cause serious consequences, whereas an over-feed of hay rarely does harm. The influence of breed and individual peculiarities are so marked in relation to digestion that it is impossible to establish a rule that will apply in all cases. Our aim should always be to supply food in sufficient quantities, in an easily digestible form, so that enough nutrient

material may be provided for the repair of the tissues without causing an overloading of the digestive organs. We want to preserve a condition of balance between destructive and reparative processes.

Varying the grain ration to correspond to the amount of labor performed is an essential factor in the preservation of the health of horses. An example will serve to illustrate. A horse accustomed to work a greater part of the time becomes incapacitated for further use on account of some trivial injury, or is perhaps, on account of stormy weather, allowed to stand idle for several days in the stable. Having become somewhat run down in flesh on account of continuous hard work, the owner concludes that it is a favorable time to get him in condition again, consequently he feeds the usual or larger quantities of grain to him. On visiting the stable some morning the owner is surprised to find the horse standing on three legs, the fourth, usually a hind one, being swollen to about four times its natural size. The foot of this is raised from the floor, while the leg is carried out stiffly from the body. The swollen member, high up on the inside of the thigh especially, is knotted and corded, and very sensitive and painful on pressure. The cause of the condition is usually attributed by the owner to a sprain that has occurred during the night, whereas the real source of the trouble is traceable to the large allowance of feed that has been supplied, resulting in an over-distension and inflamed condition of the lymphatics of the leg.

Hæmaglobinuria is another disease occurring under similar conditions. This disease occurs in a horse that has been driven but a short distance from the stable, after having remained idle for several days, on a full ration of grain, and is characterized by the sudden development of lameness in one or both hind legs, with cramp of the croup and thigh muscles, profuse sweating, finally inability to remain standing.

Colic, indigestion, purgation and other diseases might be added to those already spoken of, but enough have been mentioned to show the dangers attending the removal of an animal from hard work, placing him at rest in the stable on full grain ration. The rule to apply in such cases is to reduce the grain ration by lessening the total quantity fed, or substitute some lighter grain in place of a rich one, thereby lessening the quantity of proteid material in the feed. Coarse wheat bran may be used to advantage in these cases. Reduce the amount of corn or oats, and substitute an equal quantity by measure of bran. This keeps the bowels open and active, preventing that engorgement of the system liable to occur when the heavier feeds are continued.

The effects of a deficiency of food upon the organism is not less marked than those resulting from over-feeding. This applies not alone to the total amount supplied, but also to any of the essential elements. A deficiency of proteid constituents in a food causes rapid wasting of the muscles and loss of energy. The absence of any essential salt in a food supplied growing animals leads to imperfect development of the bony system. Sodium chloride is required by all tissues of the body, particularly the blood. In order to secure normal development of the body and to maintain it in a healthful condition, it is necessary to supply in the food all of those elements required for the complete nourishment of every tissue in the body. It is therefore essential that a sufficiency in quantity and a variety of elements be supplied in the food of working and growing animals.

In many cases farmers feed their horses year after year a ration consisting of one kind of grain, the one raised upon the farm or the one bought for the lowest price in market being the one selected. I believe such a practice to be unsatisfactory, expensive and wrong in principle. Aside from the fact that a single grain with hay may not furnish the elements in sufficient quantities required for the building up of the various tissues, is it not fair to suppose that horses, like men, relish a change of diet? Experience so teaches. A horse will after a time tire of corn, and, although fed in liberal amounts, the animal does not keep in good condition of flesh and spirit. A mixture of corn, oats and bran, with perhaps the addition of a small amount of oil meal, is sure to furnish all the essential food constituents required, and is preferred by most animals to a single grain ration. Salt must be supplied in larger quantities than is found in hay and grains. The practice of keeping it continually within reach of the horse in the form of "rocks," "bricks" or "rolls" is preferable to giving it mixed with the grain.

Foods about which there are any doubts regarding quality are best omitted from the bill of fare of horses. This does not apply so much to the products of poor land as to defects in quality due to improper curing, preservation, or the growth of vegetable or animal parasites upon the feed. To be sure, crops grown upon an impoverished soil are not as nutritious as those grown on a fertile soil. They do not nourish the animal body as well, but the effects upon the health of the animal to which they are fed are not to be feared so much as those arising from the use of such things as musty, mow-burned hay; heated, mouldy or partially decayed grains or roots. Such substances are not only deficient in nutritive constituents, but may contain material produced by decom-

position or the growth of organisms which act as poisons when ingested by the animal. The rust, mildews and smuts are included among these substances. Improperly cured hay which has become dusty exercises an injurious influence upon the respiratory organs of the horse. Musty, mouldy hay causes irritation, indigestion, colic, purgation, etc., when fed to horses. Partially fermented corn, corn meal, bran or other grains produce similar effect. Oats that have become covered with moulds, either in the field or while in storage, or other feeds in like condition, bring on in many instances, when fed, disease of the kidneys, characterized by passage of large quantities of urine. The production of abortion by feeding ergotized rye or grasses to pregnant animals is an example of disease caused by the use of feed defective in quality. Ergot may also cause gangrene of the extremities or disorders of the nervous system.

What has been said regarding the use of foods of inferior quality applies in general to all of our farm animals, but more especially to the horse. This animal is more liable to suffer on this account, owing to the structure and sensitiveness of its digestive organs.

Frequency of feeding is indicated by the anatomical arrangement of the digestive organs of the horse. On average pasturing they feed almost continuously, whereas cattle feed for a few hours during the early part of the day, remaining quiet and remasticating the food during the middle of the day, and feeding again in the afternoon. Gastric digestion goes on rapidly in equines, and as soon as the stomach becomes partially emptied the blood supply is greatly diminished. If a large amount of food is taken into the stomach after a prolonged fast, it is not digested. The organ suddenly becomes distended, the walls paralyzed and inactive. Blood does not enter the vessels surrounding the glands, consequently no juices are secreted and no digestion takes place. Under these conditions after a short time fermentation of the food mass becomes established, gas is given off, resulting in an attack of gastric flatulence, flatulent colic, or perhaps rupture of the stomach follows. Experience has demonstrated that the same quantity of feed, divided into three parts, given at morning, noon and night, gives better results with horses than when given at two feeds.

Sudden changes of feed should be avoided. A man can make no greater mistake in the treatment of his horse than to take him from a pasture, where he has been without grain, and, in anticipation of a hard day's work or a long drive, feed him a liberal quantity of oats, corn or other grains. The folly of such treat-

ment is apparent to any one accustomed to the care of stock. One often sees, however, just such mistakes made. The general rule, that all sudden changes in quantity or kind of food should be avoided, should be kept in mind. It applies to hay as well as grain. The change from oats to corn is especially liable to bring on colic. The change from corn to oats is not as dangerous, but may cause trouble. The addition to a grain ration of a considerable quantity of oil or glutin meal, rye, barley, wheat or pease may be followed by disordered digestion. So susceptible is the horse to sudden changes of feed that even a feed of clear bran may give rise to flatulent colic or other similar intestinal disease. An abrupt change from hay to grass, or from well-cured old hay to new, or from coarse, late-cut to fine early-cut hay, may cause disease. Substituting hay with hayed oats or ripe oat straw is no less a cause of intestinal disturbances. Wilted grass is even more dangerous in this respect than that perfectly fresh. Ensilage, roots, apples, etc., should only be given in small quantities at first. Gradually increasing quantities may be given until the digestive system becomes accustomed to the change. Uncooked potatoes in quantities not exceeding one or two quarts fed to horses are very apt to cause colic.

The practice of changing the grain during the day should be abandoned. It is better to feed the same kind morning, noon and night. In case it is not possible to feed the same single grain or mixtures throughout the day, a feed of hay alone, or clear oats, or a mixture of oats and bran, is less objectionable than a feed of corn, provender or other rich mixture. The practice of always giving some hay with the grain is a good one. There are but few horses that will eat too much hay if fed a sufficient amount of grain to supply the greater part of the nutrient material required by the various tissues of the body. Every horse must be given some coarse material in the form of hay, straw or stalks. There must be enough to give bulk to the food mass, or the stomach and intestines soon become diseased. The writer recently learned of the death of a valuable horse by inflammation of the bowels, brought on by feeding for several days clear oats without sufficient hay or straw. Without doubt it is best to give the greater part of the hay at night, but some should be given mornings and noons, as well. Only hay should be allowed horses that are warm and sweating freely. The grain should be withheld until the circulation becomes equalized.

The preparation of food for horses is a subject upon which there exists a diversity of opinions. There are those who advocate the use of whole grain; others who prefer it crushed, while others

again say it should be finely ground before being fed. Dry feed is preferred by some, wet by others. Some claim that cut hay is better than whole, while others consider a mixture of cut hay and grain (cut feed) preferable to hay and grain fed separately. The settlement of these questions must necessarily depend upon a variety of circumstances, such as kind of food, peculiarities of the individual, time allowed for eating, effects of cooking, etc. To cut hay or grind grain for a horse with sound teeth and strong digestive organs, and who has plenty of time for eating, is to incur an unnecessary expense that is of little or no benefit to the animal. The thorough mastication of food is natural for horses, and essential for perfect insalivation and digestion. The average daily secretion of saliva in the horse, according to Colin, is eighty-four pounds. The gland is stimulated to secrete by the act of mastication, especially so if the food is dry. If the hay is finely cut or the grain ground so that it may be swallowed after little mastication, we do not get the action of the saliva on the food or the digestive organs that nature intended. That the presence of saliva is essential to perfect gastric digestion is proved by the fact that flatulence develops soon after eating, if the salivary glands are destroyed, so that no saliva passes into the stomach with the food.

We also notice the influence of imperfect mastication on the production of indigestion and colic in horses that "bolt" their feed. Where the teeth have become badly worn, in old horses, or where there is disease of them or other organs that prevents thorough mastication, it is advantageous to cut the hay and crush or grind the grain. If not done, much of the food passes into the stomach and through the intestines whole. It is not digested, therefore does the animal no good. It is practically wasted. More than this, in passing through the intestines in large quantities it gives rise to considerable irritation, and is liable to undergo fermentation. On this account, attacks of flatulent and spasmodic colic are common among horses with irregular or diseased teeth. If a horse acquires the habit of "bolting" the grain when ground, it may be prevented by spreading it in a thin layer over the bottom of the manger, or by mixing it in the manger with six or eight smooth stones the size of the fist.

Contrary to popular opinion, cooked grains, particularly oats, are more difficult to digest than uncooked ones. By cooking I refer to boiling. Smith says: "Ellenberger and Hofmeister are of the opinion that starch conversion in the stomach of the horse occurs not only through the saliva swallowed, but by the development of a ferment from the food. They found that oats could

yield a starch-converting ferment active at body temperature, but destroyed by boiling. They have further stated that starch-converting ferments may in the horse be derived from the air swallowed with the food." Practical experience in feeding in large stables shows unquestionably that more horses suffer from indigestion, colic, etc., when fed cooked grain rather than uncooked. Certain foods, such as pototoes, pumpkins, etc., are rendered more digestible and less harmful by cooking. It it quite probable that bacteria of different species taken in with the food exert an influence over the process of digestion.

The feeding of oval, spherical, square or angular pieces of roots should be avoided. Their shape favors their arrest in the œsophagus. They should be prepared for feeding by being cut into long, thin slices, or shredded by a machine. Fine, dry, chaff-like material may also cause choking. If moistened before being fed, or the animal compelled to eat it slowly, its arrest in the gullet is prevented.

The rule with reference to watering horses is based on the results of careful investigation. It is exceedingly simple and easy to remember. Either water one-half hour before feeding or one hour after. If a large quantity of cold water is given just before eating, it predisposes to attacks of indigestion. The effect of the cold water in contact with the mucous membrane is to cause contraction of the blood vessels. This forces the blood away from the stomach and intestines. If, now, food is taken in, it cannot be digested, owing to absence of blood about the secreting glands. When cold water is taken a half-hour before feeding, the circulation of blood in the stomach and intestines becomes established, so that upon the arrival of the food the glands are in condition to perform their function. When a horse is fed, and watered directly afterward, the passage of the water through the stomach carries undigested food into the intestines, beyond the reach of the stomach and intestinal juices. The irritation of the undigested food in the intestines may cause colic. When heated, small quantities of water may be allowed, but giving large amounts should be avoided. Small amounts at frequent intervals may be allowed animals when on the road, and this is a general rule that may be applied in nearly all conditions of the animal.

SERIES OF 1897. BULLETIN NO. 5.

MASSACHUSETTS

CROP REPORT

FOR THE

MONTH OF SEPTEMBER, 1897.

ISSUED BY

WM. R. SESSIONS,

SECRETARY STATE BOARD OF AGRICULTURE.

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Crop Report for the Month of September, 1897.

Office of State Board of Agriculture,
Boston, Mass., Oct. 1, 1897.

Bulletin No. 5, Crop Report for the month of September, is herewith presented. Particular attention is called to the article on "Massachusetts Weeds," by Geo. E. Stone, Ph. D., Professor of Botany at the Massachusetts Agricultural College.

Progress of the Season.

Report No. 152 (September, 1897), of the Statistician of the United States Department of Agriculture shows a decline in the condition of corn of 4.9 points, the present condition, 79.3, being 11.7 points lower than on Sept. 1, 1896, and 3.3 points lower than the September average for the last ten years.

The condition of wheat, 85.7, is 11.1 points higher than on Sept. 1, 1896, and 4.5 points higher than the September average for the last ten years.

The average condition of oats is 84.6, as compared with 86 last month, with 74 a year ago, and 80.7, the September average for the last ten years.

The average condition of barley, 86.4, shows a decline of 1.1 points during the month, but is higher by 3.3 points than on Sept. 1, 1896, and by 1.9 points than the September average for the last ten years.

The average condition of rye, 90.1, is 8.1 points higher than on Sept. 1, 1896, and 3.1 points above the average for the last ten years.

The condition of buckwheat, 95.1, shows a slight improvement during the month. It is also 1.9 points higher than last year, and 7.3 higher than the September average

for the last ten years. In New York and Pennsylvania, the two principal buckwheat-producing States, the conditions are 98 and 97, respectively.

Tobacco has declined 3.2 points during the month, and is now 6 points below the condition Sept. 1, 1896, and 4 points below the average condition for the last ten years.

The average condition of potatoes has continued to fall, and is now only 66.7, or 11.2 points lower than last month, 16.5 points lower than on Sept. 1, 1896, and 11.7 points below the average for the last ten years.

The average condition of cotton is 78.3, as compared with 86.9 on August 1, a decrease of 8.6 points. This, however, is higher by 14.1 points than the condition on Sept. 1, 1896, and only 0.9 point below the September condition for the last ten years.

As regards the apple crop, all the New England States, with New York, Michigan, Indiana, Kansas, Missouri and West Virginia, show a very marked decline. Kentucky and Ohio show a slight decline, Virginia a marked improvement, and North Carolina and Iowa a slight improvement.

The grape reports are somewhat less favorable than a month ago. Among eastern States, New Jersey reports its crop as below the average, while Delaware and Maryland report crops which are, respectively, 87 and 70 per cent of the normal. In California the crop has been somewhat injured by hot weather, and large quantities of table grapes are being dried.

In South Corolina the rice crop is now being harvested, and in the main, reports are favorable, while in Louisiana a fine crop is confidently expected in the irrigated portions of the State.

All the States in which clover seed is an important product report an increased acreage.

Reports as to the number of stock hogs for fattening show a decrease of 9.2 per cent from that of last year. Nebraska is the only State with 1,000,000 hogs or upward from which an increase is reported, the gain for that State being 5 per cent. The condition is shown to be almost uniformly good.

In a review of the wheat situation the Statistician comes to the conclusion that "although there has been some de-

cline from the highest prices reached in August, the general tenor of the information gleaned from all available sources is not of a character to warrant either the expectation or the fear of any material cheapening of wheat until another crop is in sight, with a prospect of ampler stocks."

In Massachusetts the average condition of corn September 1 is given as 73; the average condition of rye when harvested as 91; the average condition of oats when harvested as 80; the average condition of barley when harvested as 92; the average condition of buckwheat Sept. 1 as 80; the average condition of potatoes as 64; the average condition of apples as 45; the average condition of peaches as 62; the average condition of grapes as 73; the number of stock hogs fattening, as compared with last year, as 88; the average condition of stock hogs as to weight and size as 93; and the average condition of tobacco as 67.

Temperature and Rainfall for the Whole Country.

[From United States Weather-Crop Bulletins.]

Week ending August 30. — Week slightly cooler than usual in northern New England, the upper Ohio valley, generally throughout the Lake region, the northern portion of the upper Mississippi valley and the Red River valley of the north. Throughout the Rocky Mountain region, the lower Missouri, central Mississippi and lower Ohio valleys, and generally throughout the Gulf and Atlantic coast States, the week was warmer than usual. The week was, on the whole, the driest since the beginning of the crop season of 1897. There was, however, a slight excess of rainfall in extreme southern sections, over areas of limited extent in the Lake region, and along the Atlantic coast from Maryland to southern New England. Elsewhere the rainfall was very slight or entirely lacking. In the Lake region and New England the week was too cool and in the States of the central valleys too dry for best results.

Week ending September 6. — Week slightly cooler than usual in the lower Lake region, New England and over the northern portion of the Middle Atlantic States. The week

was also cooler than usual over the north Pacific coast, the western portions of the Plateau region and in California. Along the middle and South Atlantic and Gulf coasts nearly normal conditions prevailed. In the upper Lake region, lower Ohio valley, throughout the Mississippi and Missouri valleys and the eastern Rocky Mountain slope the week was warmer than usual. Excepting the northern portion of the upper Mississippi valley, and limited areas on the southern New England and Florida coasts, and in Tennessee, the week was drier than usual. In all other districts east of the Rocky Mountains there was a total absence or an inappreciable amount of rain. In the central valleys and southern States the week was not favorable, owing to general absence of rain and prevalence of high temperatures.

Week ending September 13. — Except along the immediate Gulf and south Atlantic coasts, where nearly normal temperature conditions prevailed, the week was decidedly warm in all districts east of the Rocky Mountains. While nearly normal temperature conditions prevailed along the immediate Pacific coast, the week was decidedly cool in the interior. The temperature fell to the freezing point in extreme north-western Dakota, north-eastern Montana, and also northern Nevada, but on the whole the minimum temperatures for the week were not unusually low for the season. From the southern New England, middle and South Atlantic coasts westward over the central valleys, including the northern portion of the Gulf States and the lower Lake regions, the week was practically without rainfall, except over a few limited areas. Good rains fell over the northern portion of the upper Lake region and over portions of Texas, southern Louisiana, southern Georgia and Florida. The week was excessively hot and for the most part dry in nearly all districts east of the Rocky Mountains.

Week ending September 20. — Week slightly cooler than usual over the eastern portions of the Plateau regions, the middle and southern Rocky Mountain slopes and in New England. Throughout the central valleys, Lake region, middle and south Atlantic and Gulf States, the week averaged warmer than usual. It was also warmer than usual over the western portions of the Plateau regions and the

Pacific coast. More than the usual amount of rain fell over the southern Rocky Mountain slope, portions of Texas, Oklahoma, Kansas, Missouri, Nebraska, Iowa and Wisconsin. There was also a slight excess of precipitation in northern New England and over local areas in the Ohio valley. Elsewhere the rainfall was below the normal, no appreciable amount falling on the southern New England and middle Atlantic coasts. The week was more favorable for ripening and securing crops, but in some sections it was too dry for fallowing and seeding of fall grain. The warm weather matured the corn crop and placed nearly all of it beyond injury from frost.

Special Telegraphic Reports.

[Weather Bureau, Boston.]

Week ending August 30. — New England. Boston: First of week cloudy and rainy, latter part fine; cool nights checked growth, especially of corn, which at best will be a light crop; potatoes and cranberries very poor; tobacco much below average quality, cutting nearing completion.

Week ending September 6. — New England. Boston: Harvesting and ripening conditions much improved by warm sunny days of past week; corn gaining fast, cutting begun in extreme south; aftermath excellent; potatoes very poor; oats fair; apples, grapes and cranberries promise light yields; peaches, pears and plums abundant; tobacco cutting nearly finished.

Week ending September 13. — New England. Boston: Week of abundant sunshine, with three extremely warm days; very little precipitation; late fall feed and garden crops advanced rapidly; corn cutting general in south; cranberries badly scalded by heat; fruit prospects fair, except apples and grapes.

Week ending September 20. — New England. Boston: Favorable harvesting week; no extensive damage by frosts; fall crops looking well; corn cutting well along in south and commencing in north; tobacco curing progressing favorably; rain much needed for fall seeding.

September Weather.

September opened with nearly normal conditions prevailing and thus continued throughout the first eight days, there being during this time but two cloudy days and only one rain storm of consequence, while the temperature averaged seasonable on all except two days. Probably the most important characteristic of the month was the hot wave which set in on the 9th and lasted through the 11th, with maximum temperatures ranging in the 90's. The warmest day was the 10th, when the mercury rose as high as on any day during the summer, and, in fact, the heat was terrific, but fortunately it was not accompanied by excessive humidity. It is commonly supposed that these September hot waves are a development of recent years, but the records of the Weather Bureau indicate that this month has nearly always produced its quota of warm weather, and the highest temperature recorded at Boston in the history of this Bureau occurred on a September day — the memorable "yellow day" of 1881, the 7th, when the mercury rose to 102. Following the culmination of this September's hot wave, the temperature fell decidedly, and on no day throughout the remainder of the month did it rise beyond seasonable figures. On the other hand, beginning with the 15th, the nights became quite cool, the mercury often falling below 50. The first general frosts were on the morning of the 22d. In many localities the frost was destructive, notably on the lowlands of the interior, but in the eastern part of the State the damage was slight. Light frosts were again general on the morning of the 28th. These dates are believed to be about the average. The month closed with cool weather in force, although in its entirety it gave a slight excess in temperature.

The storm periods were few, and there were no particularly large rainfalls. The average number of days with an appreciable amount of precipitation was less than ten. The first decided storm of the month was that which commenced on the evening of the 23d and ended before noon of the 24th. This was a typical coast storm which in its earliest stages promised to be severe, but it lost much energy before reach-

ing our vicinity, and caused no more than a moderate rainfall and brisk north-east winds.

It may be said of the weather, in general, that it was very pleasant. The bright and sunny days greatly outnumbered the cloudy days, and the storms were of slight intensity as a rule. Rain was needed to settle dusty roads, but there was no lack of water otherwise, owing to the excessive rains of the preceding months. The last of the season has been much more favorable for agricultural operations than the first to the middle. The crop season opened early and with the best of promise, but unfavorable conditions soon developed and continued until nearly all classes of crops were beyond more than a partial recovery. May and June were poor growing months, owing to excessive rains, low temperature and extreme cloudiness. Farm work was suspended much of the time. July gave several days of warm, growing weather, followed by the well remembered phenomenal rains which did great damage by "drowning" plants, preventing harvesting of the grass crops and causing potatoes to blight and rot. August conditions were nearly normal, but the damage of the early season could not be overcome. For harvesting September has given excellent weather.

In the circular to correspondents returnable September 23 the following questions were asked: —

1. How does Indian corn compare with an average crop?
2. Are rowen and fall feed up to the usual average?
3. Has the average amount of fall seeding been done, and what is its present condition?
4. How does the onion crop compare with an average crop?
5. Are potatoes an average crop in yield and quality?
6. What is the prospect for root crops, celery and other late market-garden crops?
7. How have apples, pears, peaches, plums, grapes and cranberries turned out?

Returns have been received from one hundred and seventy-five correspondents, and from them the following summary has been made up: —

Indian Corn.

The good weather of the month and the absence of frosts have combined to improve the corn crop materially, but it is still far short of an average crop in most sections. In the south-eastern portion of the State, however, the season seems to have been more favorable, and there a full average crop is generally reported. There is considerable complaint that corn has not eared well and also that the ears have not filled out well. Stover, where not drowned out by the excessive rains of the early part of the season, has done somewhat better and seems fairly luxuriant. Sweet corn has suffered for the same reasons and in the same manner as field corn and is also below the average.

Rowen and Fall Feed.

Rowen was an unusually good crop, many correspondents speaking of it as the best ever known, and was secured in good condition. The conditions that worked against many other crops were particularly favorable to rowen, and also left grass roots in good condition, so that mowing lands are now in prime shape for next year's crop. Fall feed is also above the average in condition and promises to hold out well.

Fall Seeding.

According to the returns less than the usual amount of fall seeding has been done in many localities, although all agree that that which has been put in is looking unusually well. The ground was much too wet in many sections and in others it is now spoken of as too dry. These two very diverse reasons have probably had about an equal influence in keeping the amount of fall seeding done below the usual average.

Onions.

Onions are considerably less than an average crop, taking the State as a whole, and probably in the regions of commercial production they will not greatly exceed half a crop. Rot is reported in some sections and there is also some complaint of big necks. Prices are not yet fully established, but appear to be considerably better so far than for several years past.

Potatoes.

The potato crop is one of the poorest for many years, many speaking of it as hardly worth digging. Rot is general throughout the State on all but the lightest lands, and on many fields has destroyed almost the entire crop. There is also much complaint of the tubers being small and few, and altogether the condition of the crop seems to be quite the poorest of any recent year.

Root Crops, Celery, etc.

Root crops are at present in good condition and generally promise full yields. Turnips are reported to be in fine condition in the south-eastern portion of the State. Celery is generally in fair condition although there is more or less complaint of blight. Other late market-garden crops are doing well and promise good yields.

Fruits.

Apples have continued to fall off in condition and only a very light crop of winter fruit will be gathered. Pears are very abundant and generally of good quality. Peaches made a better yield than usual and were mostly of large size and good quality. Grapes show a good yield, but are so late in many instances that grave doubts are expressed as to their ripening in good shape before they are cut off by frosts. Plums were generally a good crop though there was quite a good deal of complaint of their rotting on the trees. Cranberries are only a fair crop in the region of commercial production, though perhaps their condition is a little better than it was a month ago.

NOTES OF CORRESPONDENTS.

(Returned to us September 23.)

BERKSHIRE COUNTY.

Egremont (J. H. Rowley). — Indian corn has improved greatly within the past ten days and will be three-fourths of a full crop. Rowen and fall feed are above the usual average. The usual amount of fall seeding has been done and it is looking well. Onions will be about half a crop. Potatoes are about half a crop with the quality rather under the average. The prospect for root crops, celery, etc., is good. Apples light, other fruits small except grapes, which are a full average.

Monterey (W. S. Bidwell). — Indian corn is less than an average crop and is not well filled out. Rowen and fall feed are both above the average. Less fall seeding than usual has been done. Potatoes are not an average crop in yield or quality. The prospect is good for root crops, celery and other late market-garden crops. All kinds of fruit have turned out fairly well.

Washington (E. H. Eames). — Corn is about the same as last year. Rowen and fall feed are in better condition than for the last two or three years. The average amount of fall seeding has been done and it is in good condition. Onions are about an average crop. Potatoes made a large yield but two-thirds of them are rotting. The prospect for root crops, celery and other late market-garden crops is good. Apples and pears are a full crop.

Richmond (T. B. Salmon). — Indian corn is about three-fourths of a crop. Rowen and fall feed are up to the usual average. Less seeding than usual has been done but it is in good condition. Potatoes are not an average crop in yield or quality. The prospect for root crops, celery and other late market-garden crops is good. Apples have turned out very well; pears a very large crop; no peaches, plums, grapes or cranberries.

Dalton (W. B. Barton). — Corn is about eighty-five per cent of a full crop. Rowen and fall feed are up to the usual average. Less fall seeding than usual has been done. Potatoes are not

more than thirty-five per cent of an average crop and the quality is poor. Root crops, celery and other late market-garden crops do not promise more than three-fourths of the usual yield. Apples one-fourth of a crop; pears, peaches and plums full crops. No damaging frost as yet. Silos are mostly filled.

Hancock (C. H. Wells). — Corn is not much better than half a crop. Rowen and fall feed are up to the usual average. Very little seeding is done in the fall. Onions about seventy-five per cent of a full crop. Potatoes are not more than forty per cent of an average crop and the quality is inferior. Apples light; pears and plums plenty.

Windsor (H. A. Ford). — Corn is rather late but promises to do well. Rowen and fall feed are better than they have been for ten years. No seeding done as yet. Potatoes are not more than one-tenth of a crop, and are small sized and of poor quality. The apple crop is about half that of last year.

Savoy (W. W. Burnett). — Corn has improved well during the month but is not yet an average crop. Rowen and fall feed are fifty per cent above the usual average. Less than the usual amount of fall seeding has been done, but it is in fine condition. Onions are not an average crop. Potatoes are far short of an average crop and are of inferior quality. The prospect for root crops and late market-garden crops is very promising. Fruit crops are nearly all short and of poor quality.

Florida (E. D. Rice). — Corn is backward but is a fair crop. There is an abundance of rowen and fall feed. About the usual amount of fall seeding has been done with good results. Potatoes are not more than half a crop and are rotting badly. All fruit crops are fair. Our barns are all full of hay and rowen.

FRANKLIN COUNTY.

Monroe (D. H. Sherman). — Indian corn is ten per cent off from an average crop. Rowen and fall feed are up to the usual average. Potatoes are from twenty-five to forty per cent of an average yield and are of fair quality. Turnips promise fairly, but beets and carrots are almost a total failure. Apples are one-fourth of a crop; some pears, no plums; grapes have not ripened.

Heath (O. D. Canedy). — Indian corn is about two-thirds of an average crop. Rowen and fall feed are up to the usual average. No fall seeding has been done. Potatoes are a very light crop and are rotting badly. Apples are a light crop, pears very plenty, no peaches, few plums, grapes not very plenty.

Buckland (C. E. Ward). — Indian corn is less than an average crop, probably not more than three-fourths of a crop. Rowen

and fall feed are far above the usual average. Less than the usual amount of fall seeding has been done, but that which is in is in good condition. Potatoes are not up to the average in either yield or quality. Apples are a light crop, but pears are abundant.

Shelburne (G. E. Taylor). — Indian corn is not more than a two-thirds crop. Rowen and fall feed are far ahead of the usual average. But little fall seeding has as yet been done as the ground is very dry for plowing. Potatoes are a small yield with quality fair. Apples very short. pears plenty, grapes not ripening well.

Ashfield (Chas. Howes). — Corn is not up to the average. Rowen and fall feed are up to the usual average. Not much fall seeding has been done, but that which is in is in good condition. Onions are not up to the average. Potatoes are a poor crop in yield and quality. There are not as many apples as usual, but other fruits are about as in former years.

Deerfield (Chas. Jones). — Corn is late, and though it has improved in the last three weeks will be below the average. Rowen was more than an average crop and was secured in good condition; fall feed is good and is improving. Onions are a small crop. Potatoes are a small crop with some rot. Root crops are looking well. All fruits have given light crops with the exception of pears.

Montague (C. S. Raymond). — Indian corn is a much smaller crop than was looked for a month ago and is not over sixty per cent of an average. Rowen and fall feed are much above the usual average. The average amount of fall seeding has been done and is in very good condition. Onions are rather less than an average crop. Potatoes are about half a crop of good quality where they do not rot. The prospect for root crops, celery and other late market-garden crops is rather below the average. Apples light, pears plenty, plums fair, grapes below average.

Wendell (N. D. Plumb). — Indian corn is about half a crop. Rowen and fall feed are up to the usual average. No fall seeding is done here. Potatoes are the poorest ever known, not three hundred bushels in the town. All kinds of fruit are about one-fourth of an average crop.

New Salem (Daniel Ballard). — Indian corn is not over half of an average crop. Rowen and fall feed are above the usual average. What little fall seeding has been done is looking well. But few onions are raised in this vicinity. Potatoes are at least sixty per cent below the average in yield, and of rather poor quality. Apples light, pears and plums heavy, peaches fair, grapes and cranberries light.

HAMPSHIRE COUNTY.

Enfield (D. O. Chickering). — Indian corn is much below the average. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and is in good condition. Potatoes are of good quality, but the yield is light and they are rotting badly. Celery is a very light crop. Apples light and dropping badly; pears, peaches, plums and grapes abundant; cranberries very light.

Pelham (J. L. Brewer). — Corn is less than an average crop. Rowen and fall feed are above the usual average. The usual amount of fall seeding has been done and is in need of rain to give it a start. Potatoes are the poorest crop for years, some pieces not being worth digging. Root crops, celery and other late market-garden crops promise to be very fair. Apples are about one-fourth of last year's crop; pears first-class; peaches good; plums and grapes a fair crop.

Amherst (H. A. Parsons). — Corn has improved in the last ten days but there are few good pieces because of excess of rain. Rowen and fall feed are up to the usual average. An average amount of fall seeding has been done and it is in good condition. Onions are about three-fourths of a normal crop. On dry land potatoes are a fair crop of excellent quality, but on low land they are hardly worth digging because of the rot. This has been a good year for root crops. Apples, pears, plums and grapes are good crops and peaches fair.

Hadley (H. C. Russell). — Indian corn is two-thirds of an average crop. The rowen crop is excellent and fall feed good. There has been less than the usual amount of seeding in corn because the ground has been too wet to work properly. Onions are not more than half a crop. Potatoes are rotting badly and will make a very small yield. The prospect is fair for root crops, celery and other late market-garden crops. Apples half a crop, peaches and pears good.

Granby (W. S. Clark). — Corn shows more fodder than usual but the grain crop is not over three-fourths of an average. Rowen and fall feed are better than the usual average. The usual amount of fall seeding has been done but it has not all come up yet. Onions are about half a crop. Potatoes are half a crop of good quality. Root crops, celery and other late market-garden crops show average promise. Apples scarce; pears plenty; peaches, plums and grapes average crops.

Northampton (D. A. Horton). — Indian corn is not more than half a crop. Rowen and fall feed are fully up to the usual aver-

age. Very little fall seeding has been done as yet. Onions are a full average crop. Potatoes are about half of a normal crop. The prospect is good for root crops, celery and other late market-garden crops. All kinds of fruits are light crops.

Williamsburg (F. C. Richards). — Corn did not ear out well and is not near an average crop. Rowen is far above the average and fall feed holds good. Not much seeding has been done. Potatoes are a failure as the yield is light and they rot badly. Apples are light in yield and of poor quality and are dropping badly; pears are good in yield and quality.

Huntington (H. W. Stickney). — Indian corn is not as good a crop as usual. Rowen and fall feed are better than we have had for years. About the usual amount of fall seeding has been done. The yield of potatoes is not as good as usual and more than half of them rot.

HAMPDEN COUNTY.

Chester (P. M. Adzima). — Corn is not an average crop and did not ear out well. Rowen and fall feed are the best for years. About the usual amount of fall seeding has been done and its condition is good. Potatoes are not an average in yield and are of poor quality. The prospect is good for celery, turnips and all late root crops. All kinds of fruits are good crops.

Blandford (E. W. Boise). — Indian corn is ninety per cent of a normal crop. Rowen and fall feed are considerably above the usual average. The usual amount of fall seeding has been done and is in extra good condition. Potatoes are not an average crop and many fields are hardly worth digging. Root crops promise to be a good average. There are apples enough for home use and perhaps a small surplus; pears and peaches a full crop; cranberries fair.

Russell (E. D. Parks). — Corn is short of the usual crop. Rowen and fall feed are above the usual average. But little fall seeding has been done this year. Potatoes are a very small yield and are rotting quite badly. The prospect for root crops, celery and other late market-garden crops is not very good. Apples and pears are very good indeed; other fruits fair.

West Springfield (T. A. Rogers). — Indian corn is about half of an average crop. Rowen is above the average and fall feed is good. About the usual amount of fall seeding was done, but it was late and little of it is up as yet. Onions are not over sixty per cent of an average crop. Potatoes are about half a crop of good quality. Root crops a full average; celery looking well; winter squashes half a crop and cabbages fair. Apples one-fourth

of a crop; pears and peaches full crops; plums average; grapes half a crop.

Chicopee (R. W. Bemis). — Indian corn is a poor crop in this vicinity except in favorable locations. Rowen and fall feed are above the usual average. Less than the average amount of fall seeding has been done. Potatoes are small and poor in quality. Root crops are above the average this year but not of good flavor. Quite a fair crop of early and fall apples, but winter fruit scarce; pears, peaches, plums and grapes fair.

Wilbraham (H. M. Bliss). — Indian corn is about two-thirds of a crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and is in good condition. Onions are a fairly good crop. Potatoes are half a crop of good quality. Root crops, celery and late market-garden crops promise about three-fourths yields. Pears, peaches, plums and grapes are good; apples half a crop and falling badly; cranberries half a crop.

Brimfield (G. M. Hitchcock). — Corn is not an average crop. More rowen has been cut than for many years past. Not as much fall seeding has been done as usual. Potatoes are not an average crop and there is some complaint of decay. There are but very few apples but there is a good supply of pears.

Palmer (O. P. Allen). — Corn is less than an average crop. Rowen and fall feed are far beyond the usual average. An average amount of fall seeding has been done and it is in good condition. Potatoes are a very light crop but the quality is good. The prospect for root crops, celery and other late market-garden crops is quite good. Apples and pears are less than the usual crops; peaches, plums and grapes up to the average.

Holland (Francis Wight). — Indian corn is not more than an average crop. Rowen and fall feed are more than average. There has been but little fall seeding done here this season. Potatoes are not up to the average in yield or quality. Root crops good; celery not much raised; other market-garden crops fair. Apples will be light and poor in quality; pears, peaches, plums and grapes average crops; cranberries light.

WORCESTER COUNTY.

Warren (W. E. Patrick). — Indian corn is not over sixty per cent of an average crop. The rowen crop was the largest for years and fall feed is extra good. About the usual amount of fall seeding has been done and it is in excellent condition. Potatoes are a light crop of good quality, but are rotting very badly. The

prospect is good for turnips and celery. Apples are a very light crop of poor quality; peaches, pears and plums large crops; grapes medium. All kinds of fruit seem to have very poor flavor, probably on account of so much rain and so little sunshine.

Brookfield (F. E. Prouty). — Indian corn is a good crop. Rowen and fall feed are up to the usual average. Fully an average amount of fall seeding has been done, and it is in good condition. Onions are not much raised but are a good crop. Potatoes are not more than half a crop but are of good quality. Turnips promise well. Apples are not one-fourth of last year's crop, peaches and plums little raised, grapes good, cranberries destroyed by the rains of July.

Spencer (H. H. Kingsbury). — Corn is all cut; some fields are good and others poor, according to location. A large crop of rowen was secured and fall feed is good. About the usual amount of fall seeding has been done and it is in excellent condition. Potatoes about half a crop owing to blight and rot, but the quality is fair. Root crops have grown remarkably well and are very satisfactory. Apples are very poor, pears plenty and cheap, peaches about as usual, plums plenty, grapes average but mildewed and ripening unevenly, cranberries good.

New Braintree (C. D. Sage). — Corn is about three-fourths of a crop. Rowen and fall feed are better than for several years. Very little fall seeding is done here, lands seeded in the spring look well. Potatoes are not half a crop and are rotting somewhat. There is very little done in root crops and late market-garden crops. Few winter apples; pears, peaches and plums very heavy crops; grapes are full, but can hardly mature.

Petersham (S. B. Cook). — Indian corn is sixty-five per cent of an average crop. Rowen and fall feed are fifty per cent better than usual. One-fourth less seeding has been done than usual but it is in fine condition. Potatoes are forty per cent off in yield, tubers small with some rot. Root crops of all kinds are good, also celery; late market-garden crops are only fair. Apples few, pears and plums abundant, peaches and grapes average.

Gardner (A. F. Johnson). — Indian corn is not more than two-thirds of a crop. Rowen and fall feed are up to the usual average. Potatoes are about one-quarter of a crop. Root crops, celery and late market-garden crops do not promise to be up to the average. Apples are about one-fourth of a crop and the quality is poor; pears a large crop.

Westminster (I. Dickinson). — Indian corn is not an average crop. There has been more rowen and fall feed than for many years. Not much fall seeding has been done as yet. Onions are

a very fair crop. The potato crop is next to a total failure. The prospect for root crops, celery and other late market-garden crops is very good. Apples are very few and poor; pears, peaches and plums plenty; grapes very poor.

Bolton (H. E. Babcock). — Corn is less than an average crop. Rowen and fall feed are above the usual average. The usual amount of fall seeding has been done and it is in good condition. Not many onions raised and those are below an average yield. Potatoes are about half a crop and there is some complaint of rotting. There is not much market-gardening in this section. Very few apples, pears plenty, peaches and plums rotted badly, grapes and cranberries about average crops.

Clinton (P. B. Southwick). — Corn is considerably below an average crop. Rowen and fall feed are above the average. But little seeding has been done this fall. Onions are about three-fourths of a crop. Potatoes are forty per cent of an average crop of fair quality. Squashes a light crop; melons and cucumbers also light; tomatoes average. Very few apples, pears less than average, peaches and plums above average and grapes below.

Holden (G. S. Graham). — Corn is not more than three-fourths of a full crop. Rowen and fall feed are the best for years. About the usual amount of fall seeding has been done and is in good condition. Potatoes are about half a crop and late ones are rotting badly. Root crops, celery and other late market-garden crops are good on the whole. Pears, peaches and plums are very abundant; grapes late; few winter apples.

Shrewsbury (T. F. Marston). — Indian corn is not more than two-thirds of an average crop. Rowen and fall feed are above the average. Some seeding is being done at present. Onions are less than an average crop. Potatoes are a very light crop. The prospect for root crops, celery and other late market-garden crops is very fair. Pears and peaches good, plums rotted badly, grapes not up to the average; winter apples light.

Upton (B. A. Jourdan). — Corn has a small acreage but is a fairly good crop. Rowen and fall feed never were better. A fair amount of fall seeding has been done and is coming on nicely. Onions are not as good as usual. The potato crop is a failure. No apples; plenty of pears, peaches and plums; grapes and cranberries fair.

Northbridge (H. A. Cook). — Corn is fully an average crop but is very late. Rowen and fall feed are far above the average. About the usual amount of fall seeding has been done and it is in good condition. Potatoes are not more than one-third of a crop and are very inferior in quality. Root crops and garden truck

were never better. No apples; plenty of pears, peaches and plums; grapes not ripening evenly.

Uxbridge (Augustus Story). — Corn is better than was expected; in fact, a good average crop. Rowen and fall feed are above the average. The usual amount of fall seeding has been done though the season is late. Onions are not much grown, but are an average crop. Potatoes are almost a total failure on many fields because of rot. Celery has needed warmer weather, but root crops have done fairly well. Apples a very small yield; peaches, plums and grapes are not as large as last year; cranberries not up to the usual average.

MIDDLESEX COUNTY.

Marlborough (E. D. Howe). — Indian corn is about ninety per cent of a full crop. Rowen and fall feed are far beyond the usual amount. An average amount of fall seeding has been done and it is in good condition. Onions are undersized, which makes the yield smaller, about three-fourths of an average. Blight and rot have reduced the yield of potatoes one-half. Root crops, celery and other late market-garden crops promise to be full crops if the frost holds off. Very few apples; pears a full crop; peaches three-fourths of a crop, and plums a full crop. Grapes will require at least two weeks to properly ripen.

Maynard (L. H. Maynard). — Indian corn is a normal crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and its condition is good. Onions are a normal crop. Potatoes are not an average crop, some fields being barely worth digging. Root crops, celery and other late market-garden crops promise well. Apples poor; pears normal; peaches small; plums below average; grapes short and considerable mildew noticed; cranberries about an average crop.

Boxborough (J. F. Hayward). — Rowen and fall feed are rather more than the usual average. An average amount of fall seeding has been done and it is looking well. Onions are less than an average crop. The potato crop is nearly a failure. There are very few market-garden crops except cabbages raised, but they look well. Pears and plums good; peaches ripened too early and rotted badly; apples, grapes and cranberries light crops.

Ashby (Anson Wetherbee). — Indian corn is about a three-fourths crop. Rowen and fall feed are above the usual average. Hardly any seeding has been done as yet. Potatoes are not over one-third of a yield with one-fourth of those decayed. Turnips are looking well and celery fair. Peaches, pears and plums are good crops; hardly any grapes; cranberries good; few apples.

Dunstable (A. J. Gilson). — Indian corn is above an average crop but is late in ripening. Rowen and fall feed are above the usual average. Less than the usual amount of fall seeding has been done at this time. Onions are below an average crop. Potatoes are not up to the average in either yield or quality. The prospect for root crops is very good. Apples are few and poor; other fruits above average.

Billerica (J. N. Pardee). — Indian corn is looking well at present. Rowen and fall feed are the best for years. Potatoes are much below the average, some fields being a total failure and they are also rotting badly. Almost no late apples, early ones poor and wormy; pears abundant, but of poor quality; peaches a good crop.

Lincoln (Samuel Hartwell). — Rowen and fall feed are far above the usual average. About an average amount of fall seeding has been done and it is in good condition. Potatoes are a small yield of fair quality. The prospect is good for all market-garden crops above ground, but it has been too wet for those which grow beneath the surface. Apples are a small crop; peaches and plums plenty; grapes late.

Burlington (H. H. Nichols). — Rowen and fall feed are more than average. An average amount of fall seeding has been done and it is in very good condition. Blight has cut the onion crop down one-half. Potatoes are not an average crop and are rotting badly. Root crops, celery and other late market-garden crops promise to be full crops. No apples, other fruits large yields, but plums are rotting on the trees.

Stoneham (J. E. Wiley). — Corn is about two-thirds of an average crop. Rowen and fall feed are above the average. The usual amount of fall seeding has been done and is in good condition. Onions are not more than two-thirds of an average crop. Potatoes are not up to the average in either yield or quality. Root crops, celery and other late market-garden crops promise well. Apples are a poor crop; pears, peaches, plums and grapes are all very good.

Newton (Otis Pettee). — Rowen and fall feed are rather better this year than usual. A fair average amount of fall seeding has been done and the condition is good. The yield of potatoes is fairly good, but the quality is poor, with considerable rot. Winter apples are scarce and cranberries fairly plenty.

ESSEX COUNTY.

Salisbury (Wesley Pettengill). — The season has been too cold and wet for corn and it will not be an average crop. Rowen

is an extraordinarily large crop and fall feed is above the average. Not as much fall seeding done as common but where sown it is looking well. Onions are an average crop. Potatoes are very much less than an average crop, of poor quality and rotting badly. No Baldwin apples, a few Russets of poor quality; peaches and plums good; cranberries light.

Amesbury (F. W. Sargent). — Corn is not over seventy per cent of an average crop but continued favorable weather may improve much of it. Rowen and fall feed are probably the best for years. A much increased amount of fall seeding is being done on account of the land being too wet to plant last spring. Onions are not over half a crop. Potatoes are probably not over twenty-five per cent of a crop, much of the shortage being because of rot; where there is no disease the cooking quality is extra good. Turnips, cabbage and celery are very good. Apples are scarce, pears poor in quality, peaches and plums good, grapes fair.

Haverhill (Eben Webster). — Indian corn is a little below the average. Rowen and fall feed are above the average. Less than the usual amount of fall seeding has been done. Onions are less than an average crop owing to blight. Potatoes are less than half a crop and there is much rot. There is some blight on celery; root crops about as usual. No apples, pears plenty, few peaches, plums and grapes plenty.

Newbury (G. W. Adams). — Indian corn is about ninety per cent of a full crop. Rowen and fall feed are a little above the usual average. An average amount of fall seeding has been done and is in good condition. Onions are about forty per cent of an average crop. Potatoes made a good yield but not over one-quarter will be saved from the rot. Root crops, celery and other late market-garden crops promise fairly well. Apples very light, pears good, peaches and plums very good, grapes and cranberries fair.

North Andover (Peter Holt, Jr.). — Indian corn is late. Rowen and fall feed are above the average. More fall seeding has been done than usual, though there is yet much to be done, and it is looking finely. Onions blighted somewhat and are about two-thirds of an average crop. Potatoes are a perfect failure. Root crops promise fairly, celery good, and cabbages extra. No apples; pears a large crop but not of the best quality; peaches a fine crop of extra quality; cranberries fair.

Manchester (John Baker). — Indian corn is above the average. Rowen and fall feed are above the average. About the usual amount of fall seeding has been done and its condition is extra. Potatoes are less than an average crop and have rotted badly.

The prospect is good for root crops, celery and other late market-garden crops. No apples to speak of; an average crop of other fruits without sun enough to make them really of good quality.

NORFOLK COUNTY.

Cohasset (E. E. Ellms). — Corn is more than an average crop. Rowen and fall feed are far ahead of the usual average. The usual amount of fall seeding has been done and is in good condition. Onions are a good crop. Potatoes are not up to the average in yield or quality. The prospect is good for root crops, celery and other late market-garden crops. There are few apples but all other fruits are good.

Randolph (R. A. Thayer). — Indian corn is a good average crop with a large growth of stalk. Rowen is a very heavy crop and fall feed is above the average. The usual amount of fall seeding has been done and the young grass looks well. Onions are a good average crop. Potatoes are small and rotting badly and will not be more than half a crop. Celery and beets are doing well; winter squashes from one-half to two-thirds of a crop. Apples a very small crop; pears good; grapes a full crop but late in ripening; cranberries a good crop and as yet untouched by frost.

Dedham (A. W. Cheever). — Corn is not much raised except sweet corn for market and that is below the average. Rowen and fall feed are above the usual average. Fall seeding looks unusually well and there is no falling off in area. Early potatoes are quite good, but late ones are small, poor and with many rotting. Apples poor; pears full crop; peaches on a few trees good; and grapes too late to ripen fully.

Norfolk (G. E. Holbrook). — Indian corn is not as good as last year and in fact is less than an average crop. Rowen and fall feed are much above the usual average. Not as much fall seeding as usual has been done but what has been put in is looking well. Potatoes are far below an average crop and many will buy for home use. Root crops, celery and other late market-garden crops seem to be doing well to date. All fruit crops are average with the exception of apples. Our farmers are cutting and stooking corn as fast as they can at this date.

Foxborough (E. A. Morse). — Indian corn is fully up to the average. Rowen and fall feed never were better. Farmers are doing considerable seeding just at present and some is just coming up. Potatoes are half a crop, of poor quality and rotting badly. Turnips are growing finely; cabbages good; squashes a poor yield. A few apples but of poor quality; pears a full crop;

peaches good; plums and grapes poor and grapes not ripening well; cranberries the best crop for years.

Wrentham (Thomas Breen). — Corn is less than an average crop. Rowen and fall feed are a very large crop, the largest for years. Onions are a good average crop. Potatoes are a short crop with a good deal of rot. The prospect for root crops, celery and other late market-garden crops is good. Apples short; pears, peaches, plums and grapes abundant.

BRISTOL COUNTY.

Attleborough (Isaac Alger). — Indian corn is a full average crop. Rowen and fall feed are above the usual average. The usual amount of fall seeding has been done and is in good condition. Potatoes are not up to the average in either yield or quality. There are no apples; pears fair; no peaches; grapes good, and cranberries a small crop.

Mansfield (W. C. Winter). — Corn will be above the average if it all ripens but some fields are late and probably will not ripen. Rowen and fall feed are both above the average. Not as much fall seeding has been done as usual, probably owing to the excellent condition of the pastures. Onions are more than an average crop. Potatoes are not more than half a crop of poor quality. The prospect for root crops, celery and other late market-garden crops, is, generally speaking, excellent. Apples poor and less than half a crop; pears a full crop, quality fair; peaches a very small crop, quality generally poor; grapes a full crop, quality fair; cranberries a fair crop of fair quality.

Dighton (J. N. Paul). — Indian corn looks well but the acreage is smaller than usual. Rowen and fall feed are up to the usual average. An average amount of fall seeding has been done and is in good condition. The acreage of onions is less than usual but the crop looks well. Potatoes are not up to the average in yield or quality. The prospect for root crops, celery and other late market-garden crops is good. All fruits are poor crops. Strawberry plants are looking very fine, better than on average years.

Swansea (F. G. Arnold). — The acreage of corn is smaller than last year, and the crop not quite up. Rowen and fall feed are the best I ever saw. About an average amount of fall seeding has been done and it is looking finely. Onions blighted slightly. Early potatoes yielded well and were good, late ones suffered badly from blight and rot. Wet weather has caused a heavy growth of all root crops. Apples are a failure; pears quite plenty but poor. Peaches did well and sold at from $1 to $1.25 per basket.

Dartmouth (L. T. Davis). — Both field and sweet corn has made a very large growth. Rowen was above the average and fall feed is very good. There has not been as much fall seeding as in some years but it is in good condition. Potatoes are of good quality, but the yield is below and they are rotting badly. Root crops, celery and other late market-garden crops promise very well. Fruits are not as good as they promised to be earlier in the season.

Fairhaven (F. C. Lyon). — Indian corn is much below an average crop. Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and it is in good condition. Onions are a little below an average crop. Potatoes are decidedly below the average and there has been much rot. Our special root crop, turnips, is very good. Peaches and pears light; and apples and grapes very light.

PLYMOUTH COUNTY.

Hingham (Aaron Low). — Indian corn is poor and backward. Rowen and fall feed are above the usual average. Not much fall seeding has been done as yet. Onions show a low average. Potatoes are not much more than half a crop and are small in size. Root crops, celery and other late market-garden crops promise to be a fair average. There are not many apples; pears and peaches fair, grapes badly blighted.

Brockton (Davis Copeland). — Indian corn is only five per cent off from an average crop. Rowen and fall feed are up to the usual average. About the usual amount of fall seeding has been done and it is in good condition. Onions are good on some fields, but as a rule are about a three-fourths crop. Potatoes are a small crop of poor quality with a good deal of rot. There are very few apples or peaches, but pears and grapes are plenty.

Hanover (H. L. House). — Corn is about as usual as regards quantity and quality. Rowen and fall feed are better than usual. Fully an average amount of fall seeding has been done. Potatoes made a rather small yield, the tubers are of small size. Beets promise well. Very few apples; pears and grapes plenty; cranberries about as good as common, except where the summer hailstorm ruined them.

Marshfield (J. H. Bourne). — Indian corn is just about an average crop. The rowen crop is as much above the average as the first crop of hay was. There has been rather less fall seeding than usual; condition good, though it is late. Some pieces of onions are fully up to the average and some have many scullions. Potatoes are not up to the average as a whole. Root crops are

doing well. No apples, pears plenty, peaches light, grapes not equal to last year and cranberries about three-fourths of a crop. The weather has been fine for cranberry picking and about half the crop is gathered.

Halifax (G. W. Hayward). — Corn is a fair crop on high land, but not half a crop on low land. Fall feed is better than the average and more rowen has been cut than ever before. There is rather more fall seeding than usual and it has come up well and is in excellent condition. Onions are rather below an average crop. With the exception of a few pieces, potatoes are not half a crop, but the quality is fair. Celery and turnips promise well. No apples, very few plums, no peaches and cranberries light.

Kingston (J. H. Cushman). — Corn on high land is a very full crop, on low land very poor. Rowen and fall feed are fully up to the average. There has been but little seeding done as yet. Potatoes are not more than two-thirds of a crop and the quality is poor. Root crops, celery and other late market-garden crops promise large yields. Apples scarce, pears plenty, peaches few and grapes plenty.

Carver (J. A. Vaughan). — Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and it is in good condition. Potatoes are a small crop, but the quality is good except for some rot. The prospect is good for root crops, celery and other late market-garden crops. Very few apples and those of poor quality; pears plenty, but green in color and of poor quality; cranberries about one-third of a crop.

BARNSTABLE COUNTY.

Bourne (D. D. Nye). — Indian corn is a fairly good crop. Rowen and fall feed are up to the usual average. No fall seeding of any account has been done. Potatoes are an average crop in yield and quality. Prospect very good for root crops, celery and other late market-garden crops. Apples, peaches and plums are very scarce. Cranberries up to last year or nearly so. Grass land is nearly covered with wild carrot, which kills out all the good grass.

Mashpee (W. F. Hammond). — Indian corn is above an average crop. Rowen and fall feed are above the usual average. The amount of fall seeding done is less than usual but it is looking well. Onions are more than an average crop. Potatoes are less than an average crop but the quality is good. All late garden crops are looking well, and will be above average. Apples one-fourth of a crop, pears half a crop, no peaches and plums, grapes two-thirds of a crop, cranberries half a crop.

Dennis (Joshua Crowell). — Corn is about an average crop. Rowen and fall feed are hardly up to the usual average. An average amount of fall seeding has been done and it is in good condition. Onions are much less than an average crop. Potatoes are below the average both in yield and quality. Root crops, celery and other late market-garden crops promise to be up to the average. No apples, few peaches, pears average and cranberries less than half of last year's crop.

Orleans (John Kenrick). — Corn is about ninety per cent of an average crop. Rowen and fall feed are fully up to the usual average. What little fall seeding has been done is in good condition. Potatoes are less than an average crop. No root crops raised, excepting turnips, which appear to be good. No apples, large crop of pears, no plums, grapes poor, cranberries not more than half a crop.

Wellfleet (Everett Jacobs). — Indian corn is about the same as last season. Rowen has been damaged greatly by the rains. No great amount of fall seeding has been done but that that is in looks promising. Onions are fully as good as last year. Potatoes are a very small crop of very poor quality. Turnips and beets promise well, and squashes are abundant. Very few apples, pears plenty, grapes very good and cranberries above the average.

Truro (D. E. Paine). — Rowen and fall feed are up to the usual average. The usual amount of fall seeding has been done and is in good condition. Onions are a good average crop. Potatoes are hardly up to the normal in either yield or quality. The crop of winter turnips promises to be fair. Apples and pears light, and cranberries a fair crop.

DUKES COUNTY.

West Tisbury (Geo. Hunt Luce). — Indian corn is a good average crop. Rowen is above the usual average; fall feed good but somewhat dried up. Potatoes are less than an average crop in both yield and quality. Grapes and cranberries have turned out well.

NANTUCKET COUNTY.

Nantucket (C. W. Gardner). — Indian corn is about ninety per cent of a crop. Rowen and fall feed are above the usual average. There is very little fall seeding done here. Onions are more than an average crop. Potatoes are not more than half a crop. Root crops are looking poorly; what little celery there is is looking finely. Cranberry picking not yet commenced.

BULLETIN OF

MASSACHUSETTS BOARD OF AGRICULTURE.

MASSACHUSETTS WEEDS.

By G. E. Stone, Ph.D., *Professor of Botany at Massachusetts Agricultural College.*

Emerson defines a weed as a plant whose virtues have not been discovered. The general conception of weeds is that they are useless plants, and this conception would include all of our road-side growths, such as golden-rods, etc. To the farmer, however, a weed, is not only a useless but a troublesome plant. Apropos of Emerson's conception of a weed, it may be stated that there are apparently useless plants whose virtues have been discovered, or, in other words some use has been made of them. The barn-yard grass, which is a weed throughout Europe and America, has been cultivated in Japan and is now a very important forage plant.

We can divide all of our plants into three groups, — the indigenous, or native species, the naturalized, or those which have become established; and the adventive, or those which have made their appearance once or twice but which have not become established. The latter two groups, the naturalized and the adventive, include, of course, the introduced species which grow spontaneously. It must be understood, however, that they do not include *all* cultivated species. The naturalized species make themselves at home in our soil, and they grow year after year with more or less regularity in their appearance.

The adventive plants are only recent arrivals, and may be considered as candidates for admission. Some of them make their appearance sparingly year after year, without making much headway, while others simply live one year and perhaps are not seen again, or only occasionally from time to time. The conditions which largely control the appearance of the new plants are depend-

ent upon the commercial relations with foreign countries and the new climatic conditions surrounding them.

Many of our naturalized and adventive plants have been introduced through importation, and some of them date back to a very early period in our history.

John Josselyn, an English gentleman who visited this country previous to 1672, gives a list of over thirty species of introduced plants which included such well-known forms as the dandelion, shepherd's-purse, pigweed, couch-grass, burdock, sow-thistle, stinging nettle, plantain, wormwood, chickweed, may-weed and purslane, which were grown in Massachusetts at that time, and Dr. Cutler of Salem left much valuable data concerning our introduced plants in his botanical notes, prepared previous to this century.

The writings of these early observers are of great value to botanists of the present day as some idea can be obtained as to the adaptability of the European plants. From this list of Josselyn's it will be noticed that all of these plants are common enough to-day; especially is this true in regard to dandelion, shepherd's-purse, chickweed and purslane, the latter plant being formerly grown in the garden and used for greens.

These plants found in our gardens their proper habitat, and as the cultivated areas were extended they multiplied very rapidly, until to-day they constitute the most extensive weed-growth we have to contend with. The other plants named by Josselyn, although constituting something of a nuisance, are not so abundant because the proper conditions for their thriving were not obtained.

But in order to take into consideration all of our weeds we must pay some attention to those which have been more recently introduced. The total number of naturalized plants from other countries which have been established in Massachusetts, and do now propagate themselves spontaneously, is probably about two hundred and fifty; and the total number of adventive species, or those which have grown one or more seasons but have not become established in our climate, is not far from three hundred.

While these adventive plants occur now and then on rubbish heaps, especially near manufacturing establishments and along railroads, we cannot say when any of them may take a start and in the course of a few years become as abundant and as much of a nuisance as the white daisy or wild carrot. Indeed, we know so little about the habits of some of these plants that we cannot tell what they are capable of doing in our climate. We already know that among some of the earlier introduced plants some spread only slightly; for example, coltsfoot was found in Massachusetts as

early as 1672 and has had many years to become accustomed to the climate, and yet it is to-day, although widely distributed, a very rare plant in our State. On the other hand purslane and shepherd's-purse are probably more abundant than at any time since their introduction. There are certain other plants, such, for example, as the *Geranium molle*, a specie of comparatively recent introduction, which I have observed thriving quite abundantly for a few years on lawns, when all of a sudden it would disappear. In fact, we have observed this same tendency among many recently introduced plants.

So far as our observations go it appears to be the species which show a slow and sturdy growth that threatens to become our worst weeds. An instance of this may be seen in the white daisy. This is said to have been introduced in Rhode Island about eighty years ago for the purpose of horse feed, and another report stated that it was in Massachusetts in 1783 or one hundred and fourteen years ago. To-day on account of its gradual increase it is one of the most conspicuous plants in our neglected grass lands.

The yellow daisy (*Rudbeckia hirta*), which has never become so abundant and from present appearances it would seem likely not to be, was introduced forty or fifty years ago. Ribwort (*Plantago lanceolata*), was not found by Professor Hitchcock in 1829, yet at the present time it is common enough. The fall dandelion (*Leontodon autumnalis*), quite common now, was only seen once by Professor Tuckerman of Amherst previous to 1875; and the same held true for such plants as lucern (*Medicago sa'iva*), sweet alyssum (*Alyssum calycinum*) and bladder campion (*Silene inflata*). In fact, there are many plants growing in Hampshire County which are not mentioned in Tuckerman's catalogue, which was carefully prepared and represented a remarkably full list of all naturalized and adventive species. Some of these have also, in other sections of the State, become decidedly common.

Methods by which Weeds are disseminated.

There are many methods by which weeds are disseminated. Besides the natural method, which includes the various methods of propagation characteristic of the plants, there are many artificial methods, dependent very largely upon human agencies. Besides being dependent upon seeds, there are many plants, including some of the weeds as well, which propagate themselves by means of root-stalks or underground stems, runners and running roots. Examples of propagation by root-stalks or rhizomes are furnished by the flag-root, blue iris and some ferns; while in the weeds we find a good example in the couch-grass. Plants which possess

this habit are wonderfully tenacious and are the most difficult to eradicate. Golden hawkweed is propagated by runners similar to the strawberry, and the Canada thistle by running roots. These methods of propagation are, however, merely accessory methods.

The most universal method of plant propagation is by seed, and the many ingenious ways in which plants are able to disseminate themselves is remarkable indeed. One could hardly have ever seen a dandelion without having observed the admirable seed apparatus, the seed being constructed especially for being wafted by the wind. No less interesting as wind propagators are prickly lettuce, milkweed, Canada thistle and fire-weed.

Another method of seed propagation common to some weeds is by animals. Many plants, such as the pokeweed, have berries which are eaten by birds, and as most hard seeds are not digested by them they are dropped here and there. If conditions are favorable they will readily develop. Many seeds eaten by horses and cattle are not impaired, and in this manner many weeds find new abodes. Then again we find curious devices connected with seeds for attaching themselves to animals. There are many of these devices; one of the best known plants among us which has acquired this habit is the burdock.

Through this acquired habit in seeds many plants are introduced into our State every year through wool importation. Fortunately, however, these plants are mostly confined to dump heaps about mills, and many of them at the present time have not gained much foothold in Massachusetts. Other sources of weeds are found in the importation of commercial seeds.

In oat and rye fields are the wild mustard (*Brassica sinapistrum*), chess or cheat (*Bromus secalinus*) and many other plants. One of the most impure seeds is that of red clover. The weed seeds most common in clover are rib-grass (*Plantago lanceolata*), sorrel (*Rumex acetosella*), and pigeon-grass (*Setaria glauca*). The seeds of white cockle, ragweed, prickly lettuce, pepper-grass, Canada thistle, ox-eye daisy and wild carrot are not infrequent, while those of the dandelion, etc., are often found.

Occasionally weeds as well as injurious insects and fungi are introduced with nursery stock.

Hay furnishes an excellent medium for the introduction of various weed seeds, and some of our numerous weeds owe their origin to the introduction of baled hay. Much of the glassware and crockery imported from Europe is packed in hay, and here we have a constant source of contamination. This hay is frequently used a number of times for packing purposes and is distributed to various parts of the country.

A few of our weeds were first introduced as ornamental plants and have escaped from cultivation. Golden hawkweed was cultivated at the Agricultural College some fifteen years ago, and there are some lingering patches of this plant here which may be seen every year, and it is annually sent in from other sections for determination In Vermont this plant has, according to Professor Jones, multiplied tenfold in the last decade and from all appearances it has come to stay.

Chiccory is said to have been introduced for greens by Governor Bowdoin in 1785, and although not abundant in the State it occurs in some localities quite abundantly. Purslane was introduced from England for the same purpose as early as 1672. Wild carrot and live-forever were introduced as ornamental plants. Woad waxen was brought from England to Salem in 1628 by Governor Endicott for the purpose of dyeing, and now it covers hundreds of acres in that vicinity.

Distribution of Weeds in Massachusetts.

The condition of the soil, climate and the nature and extent of the industries in Massachusetts are sufficient to exert quite an influence on the distribution of weeds.

The percentage of sand and chlorine in the soil is greater in the eastern part of the State than in the western, and the elevation is much less marked in the eastern. Then again the population and the variety and extent of industries are considerably greater in the eastern than in the western part of Massachusetts. These differences in the conditions are sufficient cause for variations in the weed flora. There are many troublesome plants along the coast which are rarely seen in the central or western part of Massachusetts, although the Connecticut valley region furnishes conditions — with the exception of the percentage of chlorine — not dissimilar to those near the coast. In general, we can say that the varieties of weeds increase as we approach the sea-board. There are many plants, however, some of which have been introduced for years, that are seldom seen inland. The conditions of soil and climate appear to be uncongenial for their growth.

The woad waxen (*Genista tinctoria*), common enough near Salem, is seldom found inland, and the same holds good for the barberry and privet, which grow so abundantly near the coast and which have probably been introduced for two hundred years.

The cocklebur (*Xanthium strumarium*) and chess (*Bromus tectorum*) abound in the waste places near Boston. The cocklebur is found inland at times, but the latter plant seldom. Many other weeds might be mentioned which are more abundant in the eastern part of Massachusetts.

A List containing Some of the Commoner Weeds of Massachusetts.

Common Name.	Botanical Name.
Barn-yard grass,	*Panicum crusgalli.*
Carpet weed,	*Mollugo verticillata.*
Charlock,	*Brassica Sinapistrum.*
Chess, cheat,	*Bromus secalinus.*
Cockle,	*Lychnis Githago.*
Cocklebur,	*Xanthium Canadense.*
Couch-grass.	*Agropyron repens.*
Crab or finger grass,	*Panicum sanguinale.*
Daisy fleabane,	*Erigeron annuus.*
Dandelion,	*Taraxacum officionale.*
Green pigeon-grass,	*Setaria viridis.*
Fall dandelion,	*Leontodon autumnalis.*
Horse-weed, fleabane,	*Erigeron Canadense.*
Pigweed,	*Chenopodium album.*
Orange hawkweed,	*Hieracium aurantiacum.*
Pepper-grass,	*Lepidium Virginicum.*
Pigweed, redroot,	*Amaranthus retroflexus.*
Plantain,	*Plantago major.*
Purslane, pusley,	*Portulaca oleracea.*
Roman wormwood,	*Ambrosia artemisiaefolia.*
Ramsted, butter and eggs,	*Linaria linaria.*
Rib-grass, English plantain,	*Plantago lanceolata,*
Shepherd's-purse,	*Bursa bursa-pastoris.*
Sorrel,	*Rumex acetosella.*
Wild carrot,	*Daucus carota.*
Yellow daisy,	*Rudbeckia hirta.*
White daisy,	*Leucanthemum vulgare.*
Three finger,	*Panicum glabrum.*
Dyer's green-weed,	*Genista tinctoria.*
Money-wort,	*Lysimachia nummularia.*

Of this list of thirty plants six are troublesome on lawns; four in gardens, twelve in hay fields, and eight are unsightly plants in waste places. Of course such a classification is not wholly accurate, as some of the weeds recorded as growing in waste places are at times found in poor grass land.

Methods of Eradication.

No general methods can be employed for the extermination of weeds inasmuch as the individual characteristics of the plant must be taken into consideration. Various kinds of cultivation have been devised to meet the requirements of weed, and an attempt has even been made to kill weeds by powerful electrical machines. Such appliances are not practical, as the enormous voltage of twenty

thousand was required to kill the plants. Could a current be made to pass through the plant from the tip of the root to the tip of the stem a much smaller voltage could be used. I have killed small plants in the laboratory with an electrical force equal to forty or fifty volts when the current was applied in this manner. Even supposing such appliances could be devised on a simple and cheap scale, so as to be utilized, they would be of no value when applied to cultivated crops, inasmuch as one of the blessings of weeds is that they remind the gardener that it is time for his crops to be hoed, and any appliance which fails to stir up the soil would be an injury rather than a help.

Other methods have been tried for weed eradication with more success. The application of chemicals to freshly cut roots, or at the base of the stem, has been used in some instances with success. For this purpose experimenters have resorted to the use of coal oil, crude sulphuric acid, salt, strong brine and carbolic acid. A few drops of carbolic acid applied with an ordinary machine oil can is considered the best method that has devised for killing weeds with chemicals. Salt has been used with some success on the Canada thistle and golden hawkweed. Experiments upon the golden hawkweed in Vermont with salt at the rate of three thousand pounds per acre have proven effectual, and at the same time have increased the yield of grass.

In the case of biennials, cutting the root below the crown usually kills them ; but occasional mowings induce them to send up numerous stalks from their roots, which, if not cut, will come to maturity and produce seed. The wild carrot affords an example of a biennial, and outside of hand pulling repeated mowing is about the only practical method which can be employed. This prevents the plant from maturing its seed, and also by checking assimilation starves the plant out.

Many root-stalks are successfully killed by exposing them to the direct action of the sun in summer or of frost in winter. Ploughing in this manner becomes effective. Certain root-stalks possess a remarkable power for propagating themselves, and when cut up even in small pieces they are capable of growing into a new plant. Any cultivation, therefore, which only breaks the root-stalks and leaves them in the ground during warm, moist weather is not practical, as this method would only multiply them.

One of the best methods for destroying the very troublesome couch-grass is to plough it up late in the fall and sow the piece down thickly with some such crop as rye.

In fact, this is one of the best methods to which farmers can resort to for weeds in general proper to cultivated lands. Instead

of allowing the land to remain idle, or surrendering it to weeds, as is most frequently the case among farmers after the crop has been taken off, it should be thickly seeded down to some crop such as rye or mustard; or much better, if the climate would allow it, to crimson clover, alfalfa or melilotus.

This practice of green manuring improves the soil. It not only adds organic matter to it but it conserves the elements which the soil contains. In case a leguminous crop is grown, such as clover, alfalfa or melilotus, considerable nitrogen would be added to the soil when ploughed under. Crimson clover and alfalfa have not proven hardy with us but melilotus appears to be, and Professor Brooks has hopes that this plant can be of some service to the farmer in this climate.

With good thick growths of rye or some such plant in the soil soon after the main crops have been removed, the large amounts of shepherd's-purse, purslane and five-finger grass — which naturally thrive at this season and produce enormous quantities of seeds for the year to come — could be kept down. The worst weeds found upon our lawns are plantain, common dandelion, chickweed, money-wort, three-fingered crab-grass and fall dandelion. The only remedy for the plantain, common and fall dandelion is spudding. The plantain is less likely to occur on a well-kept lawn. The money-wort and chickweed thrive the best in the shade, although both are more or less troublesome in sunny lawns. Nitrate of soda or common salt are used by some to kill money-wort. It is used even strong enough to kill the grass, but new grass will eventually come up at the exclusion of the money-wort. The three-finger crab-grass is seen abundantly late in summer, and appears to be spreading. We know of nothing to recommend for this.

The introduction into our fields of such weeds as chess, charlock, etc., is due to impure seed.

Another method, therefore, of checking many weeds, and one which would appear to be a very logical one, would be to start with pure seed. We have not in this country quite waked up to the necessity of buying pure seed, or of even buying seed of a guaranteed germination.

Some of our grass weeds can be controlled by mowing them just before they go to seed. One field at the Agricultural College which was densely covered with the white daisy a few years ago has, by this method of treatment, become almost completely rid of this plant. Other field weeds are more difficult to eradicate by this method as their time of maturing seed does not correspond with the time of mowing grass.

SERIES OF 1897. BULLETIN NO. 6.

MASSACHUSETTS

CROP REPORT

FOR THE

MONTH OF OCTOBER, 1897.

ISSUED BY

WM. R. SESSIONS,

SECRETARY STATE BOARD OF AGRICULTURE.

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Crop Report for the Month of October, 1897.

Office of State Board of Agriculture,
Boston, Mass., Nov. 1, 1897.

Bulletin No. 6, Crop Report for the month of October, is herewith presented as the final issue for this season. It is hoped that this work has been of value to the recipients of the bulletins. Hoping and believing this to be the case, we expect to take up this line of work again in the spring of 1898. We desire to extend the sincere thanks of the office to all our correspondents who have so kindly aided us by their reports, and shall expect a renewal of their kind offices another season.

The special articles printed this season have been as follows: Bulletin No. 1, "Small Fruits in the Home Garden," by Prof. S. T. Maynard; Bulletin No. 2, "Three Shade-tree Insects," by A. H. Kirkland, M. S.; Bulletin No. 3, "Why Milk sours, and how the Souring can be prevented or at least delayed," by Geo. M. Whitaker, A.M.; Bulletin No. 4, "Systematic Feeding and Watering as a Preventative of Disease in Horses," by Dr. Jas. B. Paige; and Bulletin No. 5, "Massachusetts Weeds," by Dr. G. E. Stone. Having been unable to secure a satisfactory article for this month's issue, we have been obliged, much to our regret, to omit this feature in the present instance.

Progress of the Season.

Report No. 153 (October, 1897) of the Statistician of the United States Department of Agriculture gives the general condition of corn as 77.1, as compared with 79.3 in September, 90.5 a year ago, and 82.5, the October average for the last ten years.

The reported average yield of wheat per acre is withheld, pending the result of a special investigation into the acreage and production of wheat in the United States, now approaching completion.

The preliminary estimate of the yield per acre of oats is 28.1 bushels. Last year the October estimate was 24.3 bushels and the final estimate 25.7 bushels. The average of quality is 87.6, which is higher by 12.7 points than the preliminary estimate of October, 1896.

The average yield per acre of rye, as indicated by the preliminary returns, is 16.1 bushels, as against 13.3 bushels, the preliminary estimate for last year. The average for quality is 92.7, as compared with 89.9 in October of last year.

The preliminary estimate of the yield per acre of barley is 24.5 bushels, which is 0.9 points higher than the October estimate of last year and 0.5 points higher than the final estimate of the average yield of last year's crop. The average as to quality is 87.6, as compared with the October average of 79.4 one year ago and 91.5 in 1895.

The condition of buckwheat declined during the month 4.3 points, the October average being 90.8.

The cotton returns indicate an average condition on October 1 of 70, as compared with 78.3 in September, 60.7 last year, and an October average of 74.5 for the last ten years. The present average is the lowest October average since 1883, with the exception of the last two years, 1895 and 1896. The decline in condition is mainly due to the long-continued drought.

The condition of tobacco has further declined 5.2 points during the month, and now stands at 70.3, which is the lowest October average in fifteen years. It is 6.6 points below last year and 11.5 points below the October average for the last ten years.

There was a marked decline during the month of 5.1 points in the condition of Irish potatoes, bringing the average down to 61.6, an exceedingly low average condition. This is 20.1 points below the October condition of last year and 13.6 points below the average October condition for the last ten years.

There are few localities where the reports on apples do not show a further decline, and even where the crops are otherwise favorable the fruit is generally undersized and in many cases of inferior quality.

The average condition of sugar cane in Louisiana is 84 and in Florida the high condition of 95 is reported.

While sorghum has suffered from the long-continued drought, the reports are in the main favorable.

The Louisiana rice crop averages 83 points, and high percentages are reported from the other rice-producing States.

In Massachusetts the average yield of rye per acre is given as 19.5 bushels; the average yield of oats as 34; the average yield of barley as 34.5; the average condition of buckwheat, October 1, as 85; the average condition of corn as 78; the average condition of potatoes as 56; the average condition of tobacco as 85; and the average condition of apples as 32.

Temperature and Rainfall for the Whole Country.

[From United States Weather-Crop Bulletins.]

Week ending September 28. — Week cooler than usual in the lower lake region, upper Ohio valley, eastern Tennessee and in the Gulf and Atlantic coast States. The week was warmer than usual over the western portion of the upper lake region, in the lower Ohio valley, and, with the exception of the west Gulf States, in all districts west of the Mississippi River. The week was practically rainless over much of the northern part of the country. With the exception of light showers over limited areas on the north Pacific coast and over portions of the southern plateau region, the territory west of the Mississippi River was practically without rain. On the south Atlantic coast and in portions of the New England and middle Atlantic States, however, the rainfall exceeded the average. The week was exceptionally dry and on the whole very favorable for maturing and gathering crops. It was, however, very unfavorable to the germination of sown grain, as well as for fallowing and seeding, which is much delayed generally throughout the western and central States.

Special Telegraphic Report.

[Weather Bureau, Boston.]

Week ending September 28. — New England. Boston: Frost in the interior on 22d killed tender vegetation, but hardy crops were generally beyond injury; harvesting practically completed; fall seeding well along; surface of ground in excellent condition; fall feed and stock seldom better than at present.

Massachusetts Weather, 1897.

[Compiled from Data furnished by the New England Weather Service.]

January averaged warmer than usual, except along the south-eastern coast, the mean monthly temperature being 26.8°, a departure from the normal of 1.6°. A warm spell prevailed from the 3d to 5th inclusive, with winter temperatures from then until the 19th, when a pronounced cold wave set in, which was again followed by moderate weather. The storms of the month were mostly rain with the exception of that of the 28th, a typical coast storm, when from 12 to 18 inches of snow fell, leaving a large body on the ground at the close of the month.

Heavy storms were not numerous during February, and the mean monthly temperature was higher than the normal by 2°. There were but two pronounced cold waves, zero weather being almost steady during the first six mornings, and the closing days bringing a cold spell. There were numerous mild, spring-like days. The precipitation was 0.95 inch below the normal. The snowfall averaged 13 inches and a good snow covering protected the ground.

March was a stormy, disagreeable month, although there was no great storm. In the first half of the month precipitation was measured on nine days, and in the last half there was another storm period from the 19th to the 27th. The precipitation was, however, slightly below normal, and the average snowfall was but 4 inches. Low morning temperatures prevailed during the first ten days, and another cold period prevailed from the 13th to the 18th. From that date on the weather was almost uniformly mild.

The monthly mean temperature for April was 2.3° above the normal. The highest temperatures were mainly recorded on the 25th, and were above 80°, as a rule. There was a sudden and decided fall of temperature on the 20th, amounting to from 40 to 50 degrees, and the mercury registered below freezing all over the State. No particular damage was caused, vegetation not being far enough advanced.

The weather of May was somewhat variable and not entirely favorable to the farmer, but the season was nevertheless earlier than the average. In the early part of the month the temperature was below normal and the nights too cold for rapid and steady growth. During the middle of the month the temperature was above the normal, but farm work was nearly at a standstill, owing to the prevalence of heavy rains from the 10th to the 17th. Grass came forward very fast, however, and promised unusually well. The latter part of the month was cool and very dry, with considerable high wind. There was much sunshine, but the cool nights held the growth of vegetation in check. Frosts occurred on the 22d and 23d, but no great damage was done.

The month of June opened unfavorably for the farmer. During the first week the weather was too cool and wet for good results. There was very little sunshine, and its absence was severely felt. Frequent rains, with hail and high winds in some localities, prevailed, although the precipitation was not heavy. The second week showed even worse conditions, there being only one clear day, and the rainfall of the 9th and 10th being exceptionally heavy. The temperature was also much below normal. The third week was more favorable, but there was still a great lack of sunshine. The nights were too cool for corn growth, the temperature falling below 50° on the mornings of the 17th and 19th. The last part of the month was more satisfactory. The rainfall was light and there was much sunshine. A warm spell set in on the 22d and terminated on the 25th, with a maxima of over 80°. There was, however, still a considerable deficiency in temperature at the end of the month.

The meteorological features of July were remarkable, and made the month one long to be remembered. The month started with normal temperatures and good growing condi-

tions. A heated spell set in on the 5th and continued without interruption until the 10th. Maximum temperatures of 90° and over were generally recorded and all crops did well. From the 12th to the 25th the temperature was about normal. From the 25th to the 29th damp east winds prevailed and the temperature averaged 8° below the normal, so that the excess of temperature for the month was not large. The precipitation for the month was most remarkable. On the 7th heavy thunderstorms traversed the State, but did little damage to crops. On the 13th and 14th a storm remained central over Massachusetts, being obstructed by an area of high barometer in the north-east, and torrents of rain fell in all parts of the State, except the extreme eastern and south-eastern portions. In western Massachusetts from 5 to 8 inches fell. The storm was attended by a gale of great violence. Much damage was done, particularly to the hay crop. The last part of the month was also unfavorable, being damp and unsettled, with no fine weather, much mown hay being caught out and spoiled.

August was a nearly normal month, meteorologically speaking, although there were several days of unseasonably cool weather. There were very few "dog-days," so called, during the month. There were some heavy rains, mostly local, but little damage resulted. Thunderstorms were frequent, but not more so than was to be expected at the time of year. The first week was warm and growing weather, with less rain than during July and much sunshine. The second week was not so favorable, there being too many showers and too little sunshine. Warm days prevailed all over the State, but the nights were cool in the interior. The third week brought overmuch rain, there being many thunder-showers. The day temperatures were nearly normal, but the night temperatures were cold and unseasonable. The last week also gave heavy thunderstorms, and the first general rainstorm came on the 24th. The 23d and 24th were cool, but the rest of the week was warm and seasonable.

Nearly normal conditions prevailed during the first eight days of September. A hot wave set in on the 9th and lasted through the 11th, the temperature on the 10th being as high

as on any day during the summer. Beginning with the 15th, the nights became cool, the mercury often falling below 50°. Light frosts occurred on the 22d and 28th. The storm periods were few and there were no particularly large rainfalls. The first decided storm commenced on the evening of the 23d. The weather in general was very pleasant, and gave excellent weather for harvesting. Bright, sunny days greatly exceeded the cloudy ones in number.

The month of October was characterized by weather conditions which, in the main, were of the best. The temperature was unusually mild and the precipitation very deficient. At many places the total monthly rainfall was less than one-half inch. The total of rainy days which would interfere with out-door work was but one, and the entire number of days with an appreciable amount of rain averaged not more than three for the entire State. The effects of the drought are not as yet greatly in evidence, as the ground is still fairly wet from the accumulated summer rains. The top of the ground, however, is dry, and streams and springs are beginning to feel the need of rain.

The month came in with conditions strongly suggestive of a return to summer. On the 1st the temperature rose above 85° in numerous localities, but late in the afternoon it began to fall, and on the 2d its range was 30° or 40° lower. The 4th, 5th and 6th were warm days. On the 7th the mercury sought a lower range, and the cool wave culminated on the morning of the 10th with the temperature varying from 25° in western and interior sections to slightly below 40° on the coast. The most marked feature of the month was the wave of summer heat which prevailed throughout the 15th and 16th. The 15th was, in every respect, a perfect summer day, and the heat was prolonged through the 16th, reaching almost 90° on the latter date. The highest October temperature on record at the Boston Weather Bureau office was 90°, on the 1st, in 1881, and this record was very nearly equalled by the temperature of the 16th of this October. The hot spell was brought to a close early Sunday morning, the 17th, when the arrival of a cold north-west wind forced the mercury rapidly down-

ward. At 8 A.M. of the 17th the thermometer stood some 30° or 40° lower than twelve hours previous, — a striking evidence of the versatility which enables our New England climate to go at one jump from midsummer temperature to autumnal chill.

The highest point of the mercury during daylight of the 17th was less than 55°, and the wind blew a furious gale all day. Low morning temperatures were the rule onward to the close of the month, and after the 19th the day temperatures ranged below 60°.

The coast sections were visited on the 21st by a tropical hurricane. On the land the accompanying north-east gale was not severe, and the full significance of the storm could not be realized. It is positively known that in the more exposed localities off shore the storm was one of unusual severity, and several vessels were driven ashore. Even in Boston harbor the seas were so tremendous and the outlook so hazardous that all coastwise steamers abandoned regular sailings.

In respect to sunshine and cloudiness the record of the month is a remarkable one. Of the first ten days, seven were either absolutely or nearly clear, and the 11th was the first cloudy day since the 24th of September. The second decade of the month (10th to 20th inclusive) gave but three cloudy days and two that were partially cloudy. The third decade was more prolific in cloudiness, giving an average of six days that were entirely overcast. On seven days of the month the percentage of possible sunshine was 100, and eleven other days gave more than three-fourths of the hours of possible sunshine. The only days absolutely without sunshine were the 11th and 12th, the 21st and 28th. Considering that October is generally regarded as a stormy month, such a record is seldom equalled. The average daily excess in temperature for the month as a whole was 3°, and the days with the greatest excesses were the 1st, 12th, 13th, 15th and 16th. The month closes with an accumulated deficiency in precipitation of more than three and one-half inches, or a daily deficiency of a trifle more than one-tenth of an inch.

Crops of the Year.

The season opened from one to two weeks earlier than usual, but the cold, wet weather of May reduced the progress of the season materially. Grass in pastures and mowings made a good start and was everywhere thick and strong. Fall seeding generally wintered well and the spring rains gave it a good start. Apples made a remarkably full bloom for an off year. Less damage than usual was reported from insects. A new imported insect, the brown-tail moth (*Euproctis chrysorrhœa*), had appeared in Cambridge and Somerville, and was causing much damage. Though the benefit of spraying against insects is generally recognized, it is resorted to only occasionally. Farm help was plenty in most localities, though good help was, as usual, difficult to secure. Wages averaged about $18 per month with board and $1.50 per day without board. No marked changes were reported in the acreage of farm crops.

In June no serious damage from insects was reported, they probably being held in check by the cold and wet weather of the month. About the usual acreage of Indian corn was planted, but much of it failed to germinate, because of cold, wet weather. These causes also gave a poor stand, slow growth and uneven crop of poor color. Haying had hardly commenced. Conditions were very favorable to grass, and a good crop of hay was promised. The acreage of early potatoes was about as in previous years, and the crop generally promised well, though somewhat backward. Early market-garden crops were late and growing slowly, but were generally satisfactory in yield and price. A slight increase in the sum total of dairy products was shown, accompanied by a slight increase in prices. The price of dairy cows still continued good. Pastures were never better at the time of year. Strawberries were a good crop. Other berries promised well. Small fruits also promised good crops.

During July insects were fairly plentiful, but not as injurious as commonly. Corn suffered much from excessive rains, and was still late. The outcome of this crop appeared to be altogether dependent upon the weather of August. Hay was a large yield, originally of a good quality, but

over-ripe in many cases and much damaged by rain. Haying was far from being completed at the time of making returns. Owing to the large hay crop, forage crops were less grown than usual, but were generally in good condition. Market-garden crops, aside from injury from excessive moisture, were in good condition and promised well. A fair crop of early potatoes was promised, good in some sections and poor in others. Apples not a full crop; pears, quinces and grapes generally full crops; peaches better than usual, but not a full crop. Pastures were universally in good condition. Rye, oats and barley were all a little above the average.

Indian corn did not improve as much as was hoped for during August, and at the end of the month was backward, and did not promise more than a three-fourths crop for the State as a whole. The frequent rains brought rowen forward well, and the best crop for many years was assured. Late potatoes promised only a very poor crop. Blight and rot were generally prevalent, and the tubers were also small and few. Tobacco suffered much from excessive rains, and was very poor as a whole. Cutting was later than usual, and not nearly completed. Late apples did not promise well. Pears unusually abundant, peaches yielding better than usual, grapes generally good, plums generally good, some complaint of rot for all fruit. Cranberries did not promise more than half a crop. Pastures were in the best condition ever reported for the time of year. Oats and barley were hardly up to the average, there being considerable complaint of rust and lodging. Poultry received little attention, except in the south-eastern portion of the State, but was nevertheless generally considered to be profitable.

The good weather of September did much to improve the corn crop, but it was still far short of an average crop. In the south-eastern portion of the State, however, a full average crop was reported. Rowen was an unusually good crop, and was secured in good condition. Fall feed was also above the average in condition, and grass roots were generally in good shape for next year. Less than the usual amount of fall seeding was done, but that in the ground looked unusually well. Onions were considerably less than an average

crop, and probably in the regions of commercial production did not exceed half a crop. Prices appeared to be better than for the past few years. Potatoes were the poorest crop for many years, rot being general, and in many cases destroying almost the entire crop. Root crops were generally in good condition and promised good yields. Only a very light crop of winter apples was promised. Pears very abundant; peaches a better yield than usual; grapes a good yield, but late; plums good, but rotting; cranberries slightly improved, but only a fair crop.

In the circular to correspondents returnable to this office October 23 the following questions were asked: —

1. Have root crops proved to be average crops?
2. What is the condition of farm stock?
3. What is the condition of fall seeding?
4. How have prices for crops raised for market compared with former years?
5. Which of the leading crops in your locality do you think have been most profitable?
6. Which of the leading crops in your locality do you think have been least profitable?
7. Considered as a whole, has the season been a profitable one for your farmers?

Returns were received from 162 correspondents, from which the following summary has been made: —

Root Crops.

On the whole, root crops are hardly up to the usual average. While many speak of them as average, only a few speak of them as above and a majority of the correspondents report that they are somewhat below. Causes for this falling off from the condition of last month are not generally assigned, but it is probably due mainly to the recent dry weather. Potatoes are as near a failure as any crop of recent years. Celery, where reported on, is generally said to have done well.

Farm Stock.

Farm stock is everywhere in fine condition. There are no reports of poor condition, and most correspondents speak

of it as being in good, fine or excellent condition. This is mainly due to the way in which fall feed has held out in pastures, it being still good, in spite of the recent lack of rain. Although pastures are in need of rain in some sections, the promise for next season is in general very good.

Fall Seeding.

Early sown fall seeding is generally reported to have made a good catch. That put in later did not start as well, and the growth of all fall seeding has been checked somewhat by the recent drought. The condition cannot therefore be said, on the whole, to be quite up to the average at present, though if abundant rains come before the ground freezes the condition will probably be brought nearly if not quite up to the normal. Less than the usual amount was done, owing mainly to the ground being too dry to give good promise of success.

Prices.

There appears to be a general improvement in prices paid for farm crops over those of recent years. This is probably due in part to the business revival and in part to the shortage which prevails in many of the crops raised by our farmers. Potatoes, which are a particularly short crop, command better prices than in any recent year. Out of 158 answers to this question, 103 correspondents speak of prices as higher than usual, 47 as average and only 8 as lower.

Most Profitable Crops.

There is a great diversity of opinion among correspondents as to which crops have proved most profitable, and some decline to attempt to answer the question. One hundred and three consider hay to have been among the most profitable crops; 22, corn; 17, potatoes; 13, sweet corn; 9, onions; 8, tobacco; 7, cabbages; 6, winter squashes; 5, milk; 5, asparagus; 5, strawberries; 4, oats; 4, apples; 4, tomatoes; 4, forage crops; 3, small fruits; 3, early potatoes; 3, cranberries; 2, rye; 2, early beans; 2, root crops; 1, turnips; 1, barley; 1, peaches; 1, raspberries; 1, celery; 1, summer squashes; 1, melons; 1, peas; and 1, lettuce.

Least Profitable Crops.

One hundred and eight correspondents speak of potatoes as among the least profitable crops; 28, corn; 23, apples; 8, cabbages; 7, squashes; 7, peas; 4, tomatoes; 3, oats; 2, cucumbers; 2, beets; 2, turnips; 1, fruit; 1, hay; 1, tobacco; 1, beans; 1, spinach; 1, currants; 1, raspberries; 1, blackberries; 1, celery; 1, grapes; 1, onions; 1, strawberries; and 1, parsnips.

Profits of the Season.

The answers in regard to the profits of the season are so diverse that it is difficult to summarize them satisfactorily. Where crops have been good, the good prices prevailing have made the season most profitable; but so many crops were at least partial failures that it is doubtful if the increased prices can entirely make up for the shortage. For the State as a whole, farmers have probably done no more than to hold their own; and, if we call the season an average one for profit, we are doing all that the facts will warrant, and possibly more.

NOTES OF CORRESPONDENTS.

(Returned to us October 23.)

BERKSHIRE COUNTY.

Alford (L. T. Osborne). — Root crops are about three-fourths of the usual average. Farm stock is in better condition than usual. Fall seeding is not as good as usual, owing to late sowing. Prices for farm products have advanced over those of the last three years. Hay has been our most profitable crop and corn our least profitable one, on account of the wet season. Comparatively speaking, the season has been a profitable one. Buyers are paying $1.50 per barrel for apples in the orchard, and furnishing barrels.

Otis (S. H. Norton). — Root crops are far short of the average. Farm stock is in good condition. Very little fall seeding has been done, but that which is in is looking well. Prices for farm crops are above the average of former years. Corn has been our most profitable crop and potatoes our least profitable one, as they were nearly a total failure. The season has not been a profitable one for the farmer.

Becket (W. H. Snow). — Root crops are not up to the average Farm stock is in very good condition. Fall seeding is looking very well. Prices have been above the average, particularly for potatoes. Hay and corn have been our most profitable crops and potatoes our least profitable one. Considered as a whole, the season has not been a profitable one. Corn turned out better than was expected, owing to the frost holding off so long.

Lee (Alonzo Bradley). — Farm stock is in first-class condition. Fall seeding is in prime shape. Prices are advanced over last year, potatoes being worth more than double what they were a year ago. Hay has been our most profitable crop and potatoes our least profitable one. Considered as a whole, the season has been an average one. There are indications that there is now a gradual return to home beef, which has been practically forced out of the market for some time by western beef.

Lenox (Alexander McConache). — Root crops are about 25

per cent above the average. Farm stock is in very good condition. Fall seeding is in first-class condition. Prices for farm crops have been about as usual. Hay has been our most profitable crop and potatoes our least profitable one. Considered as a whole, the season has been about an average one for profit. Apples and other fall crops have been secured in excellent condition as the weather has been fine.

Peru (J. B. Sennett). — Root crops have proved to be average crops. Farm stock is in good condition, as pasturage and fall feed have held out well. Fall seeding is in good condition. Prices have been better than formerly except for hay, where there is a decline. Hay has been our most profitable crop and potatoes our least profitable one. Taking into account the dairy products, the season has been above the average for profit. Apples are bringing $2.25 per barrel.

Hinsdale (S. M. Raymond). — Root crops are up to the average. Farm stock is in very good condition. Fall seeding is in good condition. Prices for crops raised for market have not been as good as in former years. Hay has been our most profitable crop and potatoes our least profitable one. Considered as a whole, the season has not been a profitable one.

Cheshire (L. J. Northup). Root crops have proved to be average crops. Farm stock in good condition. Fall seeding is looking fairly well. Prices for farm crops have been above the average. Hay has been our most profitable crop and potatoes our least profitable one. The season, as a whole, has been profitable for our farmers.

New Ashford (Elihu Ingraham). — Root crops are up to the usual average. Farm stock is in fine condition. Fall seeding is in very fine shape. Potatoes bring double the price of former years and other crops are about as usual. Oats, hay and corn have been our most profitable crops and potatoes our least profitable one. Considered as a whole, the season has not been a profitable one for our farmers.

FRANKLIN COUNTY.

Rowe (J. F. Brown). — Root crops are above the average. Farm stock is in good condition. Grass on hay fields is green and strong and a good crop for next year is assured. Prices for farm crops have been fully up to the average. Hay has been our most profitable crop and potatoes our least profitable one. Potatoes, though a light yield, have been of good quality. Apples are rather poor, but are selling at $2 per barrel. The present year has been fully up to the average for profit.

Charlemont (H. S. Giles). — Root crops are fully up to the average. Fall seeding made a good catch and promises well. Farm stock is in average condition. The shortage in yield has increased the price of many farm crops. Hay has been our most profitable crop and pears our least profitable one. The season will compare favorably for profit with any average one. No. 1 apples are selling at $2 per barrel and No. 2 at $1.

Buckland (C. E. Ward). — Not much is done in the line of root crops. Farm stock is in good condition. Fall seeding is in good condition. Apples and potatoes are about the only crops sold direct from the farm, and prices have been higher than usual for these. Apples have been our most profitable crop for those who have them and potatoes our least profitable one. The season has not been a profitable one, as dairying is the principal business of our farmers, and prices have ruled too low for profit.

Conway (J. C. Newhall). — Root crops are hardly up to the average. Farm stock is generally in good condition, as pastures have been good. Fall seeding is looking very well, although suffering from drought on some land. Prices have been higher for most crops than of late years. Tobacco is probably our most profitable crop and corn and potatoes our least profitable ones. I should say the year had been about an average one for profit. Apples are mostly sold at $2 per barrel.

Gill (F. F. Stoughton). — Farm stock is in good condition. Potatoes and apples bring higher prices than they usually do. Hay has been our most profitable crop and cucumbers our least profitable one. Considered as a whole, the season has not been a profitable one for our farmers.

Erving (C. F. Clark). — Root crops are not up to the average. Farm stock is in good condition. Fall seeding is looking very well. Prices for crops raised for market are somewhat higher than usual. Hay has been our most profitable crop and potatoes our least profitable one. Considered as a whole, the season has not been a profitable one for our farmers.

Montague (C. S. Raymond). — Root crops are not up to the usual average. Farm stock is in good condition, as fall feed has been fine. Fall seeding is in about average condition. Prices for farm crops are about 25 per cent better than in recent years. Potatoes, onions and hay have been our most profitable crops and corn our least profitable one. I think, on the whole, the season has been an average one for profit.

Sunderland (J. M. J. Legate). — Onions and potatoes are not over one-half crops; other roots not raised. Farm stock is looking well. Fall seeding has been looking well, but is now badly

in need of rain. Prices for farm crops have been higher than in former years, owing partly to the business revival and partly to poor crops. If tobacco sells well it will be our most profitable crop, with onions second. Fruits, hay and corn have been our least profitable crops. The season has not been a profitable one, as the shortage in yield has more than offset the rise in prices.

Leverett (W. L. Boutwell). — Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is looking well. Prices for farm crops rule about the same as for the last two years. Tobacco has been our most profitable crop and potatoes our least profitable one. The season has decidedly not been a profitable one for our farmers.

HAMPSHIRE COUNTY.

Greenwich (W. S. Douglas). — Root crops are not up to the average, owing to wet weather. Farm stock is in good condition. Fall seeding is looking very well. Prices have been good for all crops raised for market. Potatoes have been our most profitable crop and corn our least profitable one. The season is probably an average one for profit, small yields offsetting good prices.

Pelham (J. L. Brewer). — Root crops are not quite up to the average. Farm stock is in fair condition. Most of the fall seeding is looking well. I think prices for farm crops have been higher than for some years. Grass has been our most profitable crop and potatoes our least profitable one. The season has not been a profitable one, as, hay and celery excepted, our crops have partially or entirely failed and our cellars were never so empty.

Amherst (Wm. P. Brooks). — English turnips good, Swedes medium, carrots good. Farm stock is in good condition. Early sown fall seeding is in good condition, but late sown has grown slowly, on account of dry weather. Prices for tobacco, onions and potatoes are much higher than in recent years; hay is lower by $3 per ton. Tobacco and onions have been our most profitable crops and corn and potatoes our least profitable ones.

South Hadley (H. W. Gaylord). — All root crops are low in percentage of yield, potatoes perhaps the most so. Farm stock is looking finely, pastures having held out unusually well. Early sown fall seeding looks well, late sown has not made much growth. Prices have been above average for all crops, particularly for potatoes. Hay and tobacco have been our most profitable crops and potatoes and corn our least profitable ones. The season has not been a profitable one, owing to the shortage in nearly all crops.

Northampton (D. A. Horton). — Root crops are up to the usual

average. Farm stock is in good condition. Fall seeding is in fair condition. Prices for farm crops are fully up to the average of past years. Hay has been our most profitable crop and tobacco our least profitable one. Considered as a whole, the season has not been a profitable one for our farmers.

Southampton (C. B. Lyman). — Root crops are up to the usual average. Farm stock is looking very well. The growth of fall seeding has been retarded by the recent dry weather. Prices have ruled from 25 to 50 per cent higher than in recent years. Hay has been our most profitable crop and corn our least profitable one. Considered as a whole, the season has not been a very profitable one. Those who have apples are realizing good prices for them.

Chesterfield (Horatio Bisbee). I do not think root crops are up to the usual average. Farm stock is in good condition. Fall seeding is not in good shape, owing to dry weather. Prices for farm crops compare fairly well with former years. Hay has been our most profitable crop and potatoes our least profitable one. The season has not been a very profitable one. Apples are scarce and butter is low in price.

Middlefield (J. T. Bryan). —Root crops, with the exception of potatoes, have been up to the usual average. Farm stock is in excellent condition. Fall seeding is in good condition. Prices have been higher than for several years except for hay. Corn, oats, barley and apples are our most profitable crops and potatoes our least profitable one. Considered as a whole, the season is above the average for profit.

HAMPDEN COUNTY.

Blandford (E. W. Boise). — Root crops are about 10 per cent below the usual average. Farm stock is in extra good condition. Fall seeding is in fair condition. Crops raised for market have brought about average prices. Apples have been our most profitable crop and potatoes our least profitable one. The season has been a profitable one, as dairy products, beef, pork and fruit have all sold readily, though not at high prices. Farm stock commands good prices at ready sale, but is scarce, as most farmers are little more than two-thirds stocked.

Russell (E. D. Parks). — Root crops are very good, with the exception of potatoes. Farm stock is in very fair condition, but not as good as before the dry weather set in. What fall seeding has been done is looking well. Prices for farm crops are much better than usual. Corn and hay have been our most profitable

crops and potatoes our least profitable one. Considered as a whole, the year has been a very good one. Beef and pork are higher than formerly and there has been a good demand for milch cows.

West Springfield (N. T. Smith). — Beets and carrots below average, early turnips very poor, late crop good. Farm stock is in good condition and neat stock of all kinds is scarce. Fall seeding has greatly improved and is in good condition. Prices for farm crops have ruled higher than usual, owing to shortage in quantity. Hay has been our most profitable crop and apples our least profitable one. With a few exceptions, it has been the hardest year for farmers I can recall in forty years.

Agawam (R. DeWitt). — Root crops are up to the usual average. Farm stock is looking well. Early fall seeding is doing finely, but it has been a little too dry for the later. The price of market crops it higher than in former years. Hay and tobacco have been our most profitable crops. I think the season has not been profitable as a whole in the Connecticut valley.

East Longmeadow (J. L. Davis). — Root crops are about 60 per cent of an average crop. Farm stock is in good condition. It is too dry for late fall seeding. All crops have commanded good prices, one-third more than common. Hay has been our most profitable crop and potatoes our least profitable one. Dairy farmers have done well, others have made a failure of the season.

Wilbraham (F. E. Clark). — Root crops have done well, especially turnips. Farm stock is in fairly good condition. Early seeding is looking well. Prices for most farm crops are higher than for several years back. Hay has been our most profitable crop and potatoes and corn our least profitable ones. The season has hardly been a profitable one, the summer having been too wet for most crops.

Monson (A. H. White). — Root crops are not up to the average. Farm stock is in very fair condition. Fall seeding is looking rather slim. Prices are rather on the rise, compared with other years. Apples and potatoes are bringing fair prices, but there has been no profit in anything this year.

Wales (C. F. Crawford). — Root crops are about average. Stock is healthy and in good condition. Potatoes and apples are high, hay cheap and vegetables about as in former years. Hay, corn and potatoes have been our most profitable crops and apples our least profitable one. I think we have had a good season. Apples are selling for $2 per barrel, but the crop is light.

Holland (Francis Wight). — Root crops have not proved to be up to the average. Farm stock is in good condition. Fall seeding

is fairly good. Prices are fully up to the average, if not higher. Potatoes have been our most profitable crop and apples our least profitable one. Taking everything into consideration, I do not think the season has been a profitable one.

WORCESTER COUNTY.

Dudley (J. J. Gilles). — Root crops are up to the usual average. Farm stock is in excellent condition. Early fall seeding is in good condition, but late seeding is a little backward on account of dry weather. Prices for farm crops are about 10 per cent above last year. Hay and cabbages have been our most profitable crops and potatoes and late squashes our least profitable ones. Considered as a whole, the season has been a profitable one.

West Brookfield (L. H. Chamberlain). — Root crops are wormy and poor. Farm stock is in first-class condition. Fall seeding is looking well. Prices for farm crops are a little better than of late years. Corn and hay have been our most profitable crops and potatoes our least profitable one. Considered as a whole, the season has been a profitable one and farmers are a little more smiling than of late.

North Brookfield (J. H. Lane). — Root crops are up to the average. Farm stock is in good condition. Fall seeding is but little practised. Prices are from 10 to 20 per cent lower than in former years. Milk has been our most profitable product and apples and potatoes our least profitable crops. The season has been a profitable one to milk producers. The fall season has been excellent for fall work, but rain is needed.

Oakham (Jesse Allen). — Root crops are not more than half the usual average. Farm stock is in good condition. Fall seeding is in good condition. Potatoes and apples bring higher prices than usual, milk the same and hay less. Milk has been our most profitable product and potatoes our least profitable one. The season has been a fairly profitable one, considered as a whole.

Dana (E. A. Albee). — All roots are up to the average except potatoes. Farm stock was never in better condition. Fall seeding has made a good catch. Prices for farm crops are very good. Hay has been our most profitable crop and potatoes, corn and apples our least profitable ones. The season has not been a profitable one, because farmers have little to sell except dairy products.

Ashburnham (A. Needham). — Root crops are about average. Farm stock is in very fine condition. Fall seeding which was sown early is looking well. Hay has been our most profitable crop and apples our least profitable one. Considered as a whole, the season is hardly up to the average for profit.

Lunenburg (J. L. Harrington). — Root crops are hardly up to the average. Farm stock is in excellent condition. Very little fall seeding is done. Prices for farm crops are higher than of late years. Peaches have been our most profitable crop and potatoes our least profitable one. So many crops have proved almost a failure that the higher prices received have not made the year a profitable one.

Princeton (Preston Knight). — Turnips are an average crop, other root crops below average. Farm stock is in very good condition. Fall seeding is doing well. Prices are about 90 per cent of those usually ruling. Hay has been our most profitable crop and potatoes and squashes our least profitable ones. The season has not, considered as a whole, been a profitable one.

Rutland (L. S. Dudley). — Root crops are not up to the average. Farm stock is in good condition. Fall seeding is in good condition. Prices for farm crops are about average. Hay, corn and fodder crops have been our most profitable crops and potatoes, squashes and apples our least profitable ones. The season has not been a profitable one.

Worcester (S. A. Burgess). — Root crops are not up to the average. Farm stock is in good condition. Fall seeding is in good condition. Prices are quite as low as for the last three years. Hay has been our most profitable crop and potatoes our least profitable one. Considered as a whole, the season has been a profitable one. September and October have been quite favorable to the maturing of corn, fruit and vegetables, and the growth of late crops, including turnips, cabbages, beets and celery.

Southborough (E. F. Collins). — Root crops are up to the usual average. Farm stock is in better condition than is usual at this time of year. Fall seeding is in very good condition. Prices of farm crops are higher than in former years. Hay, early potatoes and tomatoes have been our most profitable crops and late potatoes our least profitable one. The season has been a profitable one for those who hustled.

Millbury (C. H. Stockwell). — Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is now very promising. Average prices for farm crops have prevailed. Hay, grain and green fodder crops have been our most profitable crops and potatoes our least profitable one. The season has been a profitable one, as, while some crops have nearly failed, others have been good.

Oxford (D. M. Howe). — Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Average prices have prevailed for farm crops.

Hay and rye have been our most profitable crops and potatoes and corn our least profitable ones. Considered as a whole, the season has been a profitable one.

Douglas (Wm. Abbott). — Root crops are up to the usual average. Farm stock is in good condition. Very little fall seeding has been done, but that which is in is looking well. Prices are about average except for potatoes, which are higher. Hay has been our most profitable crop and potatoes and apples our least profitable ones. Considered as a whole, I do not think the season has been a profitable one.

Mendon (J. J. Nutter). — Root crops are nearly up to the average. Farm stock is fully up to the average in condition. Fall seeding is in very good condition. Prices have not differed much from former years on the whole. Hay has been our most profitable crop and potatoes our least profitable one. The season has been quite good, but farming was unprofitable, all things considered.

Hopedale (Delano Patrick). — Farm stock is in good condition. It has been rather too dry of late for fall seeding. Prices for farm crops have been somewhat above the average. Hay has been our most profitable crop and potatoes and apples our least profitable ones. The season has been slightly less profitable than usual, considered as a whole.

MIDDLESEX COUNTY.

Hopkinton (W. V. Thompson). — Root crops are not up to the usual average. Farm stock is in good condition. Fall seeding is in fair condition. Hay and corn have been our most profitable crops and potatoes our least profitable one. Considered as a whole, the season was a profitable one. The month was very favorable to farm work, and frost held off until the 10th of the month.

Framingham (H. S. Whittemore). — Root crops are up to the usual average. All stock is looking well. Fall seeding is somewhat backward, owing to dry weather for the past few weeks. Prices are 50 per cent better than for some years. Tomatoes, sweet corn and onions have been our most profitable crops and cabbages, beets and turnips our least profitable ones. The season has been a profitable one, owing to the higher prices.

Sudbury (E. W. Goodnow). — Root crops have turned out well. Stock has done uncommonly well this season. Fall seeding is in good condition. Crops have sold better this year than formerly. Potatoes, squashes, celery and tomatoes have been our

most profitable crops and cabbages, spinach and corn our least profitable ones. To those who have been lucky enough to have good crops the year has been a profitable one.

Stow (G. W. Bradley). — Root crops are up to the usual average. Farm stock is above the average in condition. Fall seeding looks first rate. Prices have been better than for some time. Fruits and onions have been our most profitable crops and potatoes our least profitable ones. Considered as a whole, the season has been the best for a number of years.

Littleton (G. W. Sanderson). — Root crops are up to the usual average. Farm stock is in good condition. Much more fall seeding than usual has been done and is in good condition. Prices are higher than of late years. Hay has been our most profitable crop and apples and potatoes our least profitable ones. Considered as a whole, the season has been fairly profitable.

Dunstable (A. J. Gilson). — Root crops are rather above the average. Farm stock is generally in good condition. Fall seeding is looking finely. The prices for crops have ranged about the same as for several years. Hay and corn have been our most profitable crops and potatoes our least profitable one. The season has certainly not been above the average for profit. Apples have been a very light crop, with few fit for market at any price.

Carlisle (E. J. Carr). — Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Prices for farm crops have been above the average. Sweet corn has been our most profitable crop and peas our least profitable one. Considered as a whole, the season has been a profitable one. Indian corn has been the best crop raised, although it is not one of the leading crops here.

Bedford (Henry Wood). — Root crops have proved up to the usual average. Farm stock is in good condition. Fall seeding is in fair condition. Prices have not been as good as in former years. Strawberries, asparagus and early sweet corn were our most profitable crops, and potatoes and peas our least profitable ones. The season has not been very profitable in this section. Apples very scarce and bringing high prices.

Concord (Wm. H. Hunt). — Root crops have done well. Stock is in good condition. Fall seeding has made favorable progress where it was done early. Prices for farm crops have generally been better than last year. Asparagus, strawberries and squashes have been our most profitable crops and potatoes our least profitable one. The season has been as profitable as usual. Pears have been abundant, but prices have been low. Apples are scarce and poor and bring high prices.

Woburn (W. H. Bartlett). — Beets undersized, carrots very short crop, parsnips fair and turnips good. Farm stock is in good shape, feed never having been better at this time. Fall seeding is above the average in condition. Prices are about the same as usual, with a few exceptions. Asparagus, early beans, sweet corn, summer squash and winter squash have been our most profitable crops, and early peas, early cabbage, potatoes, currants, raspberries and blackberries our least profitable ones I think the season will average about with others so far as profit is concerned.

Wakefield (Chas. Talbot). — Root crops are 15 per cent above the normal. Farm stock is in very good condition, as pastures have held out well. Fall seeding is in very fair shape. Prices have ranged from 20 to 25 per cent higher than usual for most crops. Onions, cabbages and sweet corn have been our most profitable crops and potatoes our least profitable one. Owing to good prices, the season has been a profitable one.

Winchester (Marshall Symmes). — Root crops are up to the usual average. Farm stock is in very good condition. The ground is rather dry for strong growth of fall seeding. Prices are low for most crops, even when compared with other low years. Early corn and lettuce have been our most profitable crops and peas and celery our least profitable ones. Considered as a whole, the season has been a profitable one.

ESSEX COUNTY.

Salisbury (Wesley Pettengill). — Root crops are below the average. Farm stock is in better condition than usual. Fall seeding is in good condition. Prices have been higher than in former years for most crops. Hay has been our most profitable crop and potatoes our least profitable one, many fields being hardly worth digging. I do not think the season has been a profitable one, having been too cold and wet for anything but grass. Apples scarce and high.

Groveland (Abel Stickney). — Root crops are nearly or quite an average. Farm stock is looking well, as pastures have held out well. Early sown fall seeding is looking well, but late sown is not as good. Prices have been better than usual for farm crops. Hay has been our most profitable crop and apples our least profitable one. So many crops have been poor this season that I do not think the season has been a profitable one.

West Newbury (J. C. Tarleton). — Root crops have done very well. Farm stock is in good condition. Fall seeding is looking

well. Prices have been about as usual. Hay has been our most profitable crop and potatoes our least profitable one. The season has been about an average one for profit.

Newbury (G. W. Adams). — Root crops are up to the usual average. Farm stock is in very good condition. Fall seeding is hardly average, owing to dry weather. Prices have been well up, when compared with other years. Onions have been our most profitable crop and potatoes our least profitable one. Considered as a whole, the season has been very far from a profitable one.

Ipswich (O. C. Smith). — Root crops are not up to the average. Farm stock is in good condition and cows have kept up their flow of milk until the frost hurt the grass. Fall seeding is about average in condition, and with more rain will improve. Prices have been higher for farm crops than of late years. Hay has been our most profitable crop and potatoes our least profitable one. It has hardly been a profitable year. Pears plenty, but low in price; apples scarce and poor; grapes injured by frost.

Topsfield (B. P. Pike). — Root crops are up to the usual average. Farm stock is in excellent condition. Fall seeding was never in better shape. Prices have ranged a little above the average for most crops. Hay and milk have been most profitable with us and apples least so. Considered as a whole, the season has been a profitable one.

Wenham (N. P. Perkins). — Beets and parsnips, average crops; carrots, onions and turnips below average. Farm stock is generally looking well, as feed has been good in pastures. Fall seeding is looking well. Prices have been rather better than last year, with some exceptions. Tomatoes, sweet corn and cabbages have been our most profitable crops, and squashes, peas, onions, potatoes, corn and beets our least profitable ones. If prices hold good this winter the season will be a fairly profitable one.

NORFOLK COUNTY.

Franklin (C. M. Allen). — Root crops, with the exception of potatoes, are up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Prices have been average for all crops this season. Hay has been our most profitable crop and potatoes our least profitable one. Considered as a whole, the season has not been a profitable one.

Millis (E. F. Richardson). — Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Prices have been higher this season than usual.

Hay has been our most profitable crop and potatoes our least profitable one. Considered as a whole, the season has been a profitable one to our farmers.

Sharon (H. L. Naramore). — Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in excellent condition. Prices for farm crops are about the same as usual, except for potatoes, which are much higher than usual. Hay has been our most profitable crop and potatoes and apples our least profitable one. I don't think any season is profitable, as I believe "profit" is only what is left after charging the farm interest, taxes, insurance, repairs, deterioration and a dollar and a half for each day's labor.

Canton (B. R. Doody). — Root crops are not up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Better prices have prevailed than for some years past. Hay has been our most profitable crop and potatoes our least profitable one. Considered as a whole, the season has been a profitable one.

Stoughton (C. F. Curtis). — Root crops are good, but are little raised. Farm stock is in better than average condition. Fall seeding is in good condition. Corn for the silo and hay have been our most profitable crops and potatoes our least profitable one. This has been a very profitable year.

Avon (S. F. Oliver). — Root crops are not up to the average. Farm stock is in fair condition. Fall seeding is in good condition. Prices have been a little better than formerly. Hay has been our most profitable crop and potatoes our least profitable one. Considered as a whole, the season has not been a profitable one.

Cohasset (E. E. Ellms). — Root crops have turned out well. Farm stock is in excellent condition. Fall seeding is in very good condition. Prices have ruled about the same as in former years. Sweet corn has been our most profitable crop and potatoes our least profitable one. Considered as a whole, the season has not been a profitable one.

BRISTOL COUNTY.

Easton (H. M. Thompson). — Root crops have done well with the exception of potatoes, which rotted badly. Farm stock is in good condition. Fall seeding is in very good shape. Prices have been a little better than usual. Strawberries and cranberries have been our most profitable crops and potatoes our least profitable one. Considered as a whole, the season has been fairly profitable.

Norton (Wm. A. Lane). — Root crops are up to the usual aver-

age. Farm stock is in good condition. Fall seeding is looking well. Prices have been fully up to those of former years. Hay has been our most profitable crop and potatoes our least profitable one. I think the season has been a profitable one.

Raynham (N. W. Shaw). — Root crops are not up to the usual average. Farm stock is in very good condition. Fall seeding is much above the average in condition. Prices have been about as usual and crops small. Potatoes have been our most profitable crop where they did not blight and corn our least profitable one. This has been about an average year, as far as profit is concerned.

Dighton (J. N. Paul). — Root crops are up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Prices average about the same as in other years. Strawberries and small fruits were our most profitable crops and potatoes, apples, cabbages and tomatoes our least profitable ones. The season has not been a profitable one, but was better than last year. Strawberry plants are looking well. No good apples in town. Tomatoes not more than 10 per cent of a crop.

Somerset (Joseph Gibbs). — Root crops are not average. Farm stock is in good condition. Fall seeding, owing to dry weather, is not in good condition. Prices have been better than last season for most crops. Potatoes have been our most profitable crop and cabbages and cranberries our least profitable ones. The season has been more profitable than the last two or three, but I do not think farmers have made much money.

Westport (A. S. Sherman). — Root crops are up to the average, turnips being very fine. Farm stock is in first-class condition. I never saw fall seeding look better. There is very little change in prices except for potatoes, which are higher than usual. Hay has been our most profitable crop and oats our least profitable one. The profits of the season have been rather above the average. Onions almost a failure, apples very scarce, pears plenty.

Acushnet (M. S. Douglas). — Root crops are not up to the usual average. Farm stock is in good condition. Fall seeding is in good condition. Prices have compared favorably with those prevailing of late years. Hay has been our most profitable crop and potatoes our least profitable one. Considered as a whole, the season has been a fairly profitable one.

PLYMOUTH COUNTY.

Brockton (Davis Copeland). — Root crops have proved to be good average crops. Farm stock is in good condition. Fall seed-

ing is in good condition. Prices are as good as those of last year, but not as high as some years. Hay has been our most profitable crop and potatoes our least profitable one. Considered as a whole, the season has been a fairly profitable one.

West Bridgewater (F. E. Howard). — Root crops are all good except potatoes. Farm stock is in good flesh. Fall seeding is in good condition. Prices have ruled better than last year. Hay promises to be our best crop and potatoes our least profitable one. The season has not been very profitable. No apples; grapes late; pears plenty, but of poor quality.

Bridgewater (Rowland Cass). — Root crops are slightly above the average. Farm stock is in good condition. Fall seeding is looking well. Prices have been slightly higher than in former years. Root crops have been our most profitable crops and potatoes and squashes our least profitable ones. Taken as a whole, I do not consider the season a profitable one.

Duxbury (A. M. Goulding). — Root crops good, turnips being of especially fine flavor. Farm stock is in remarkably good condition. Fall seeding is looking even and good, but is a little backward. Prices have not varied much for two or three years. Hay has been our most profitable crop and potatoes our least profitable one. The season has been the most profitable one for five years, taken all in all.

Carver (J. A. Vaughan). — All root crops except potatoes have done well. Farm stock is in good condition. Fall seeding is not in good shape, on account of dry weather. Crops raised for market have brought average prices. Hay has been our most profitable crop. Considered as a whole, the season has been a profitable one. The cranberry crop is our leading crop. The crop is small, but the berries are keeping well and promise to bring fair prices.

Lakeville (Elbridge Cushman). — Root crops are up to the usual average. Farm stock is in excellent condition. Fall seeding is in good condition. Prices have ruled about as usual. Potatoes, corn and hay have been our most profitable crops and apples our least profitable one. On the whole, I consider the present year to be a favorable one.

Mattapoisett (A. R. Swift). — Root crops are up to the usual average. Farm stock is in good average condition. Fall seeding is in good condition. Prices have compared well with those prevailing in former years. Hay has been our most profitable crop and potatoes our least profitable one. As far as I can learn, the season has been a profitable one.

BARNSTABLE COUNTY.

Falmouth (D. R. Wicks). — Root crops are fully up to the average. Farm stock is in fine condition. It has been rather dry for fall seeding and it is small, but is coming on fast. Prices for farm crops have been fully up to former years. Potatoes have been our most profitable crop and cabbages our least profitable one. The season has been about as usual for profit. Potatoes are fine with no rot and bring high prices, which helps out wonderfully.

Mashpee (W. F. Hammond). — Root crops are about an average crop. Farm stock is in good condition. Fall seeding is looking very well, considering the dry weather. Prices for crops raised for market have been above the average. Hay has been our most profitable crop and corn our least profitable one. Higher prices have made up for the shortage of crops, so that farmers have about held their own.

Sandwich (J. R. Holway). — Root crops are up to the average, turnips being a fine crop of good quality. Farm stock is in good condition. Fall seeding is below the average, owing to dry weather. Prices have ruled better than for several years. The cranberry crop was small, but harvested in good condition. Prices are better than last year, but not as good as were expected.

Barnstable (John Bursley). — Potatoes half a crop, turnips small crop, onions average. Farm stock is in good condition. Fall seeding backward, because of drought. Prices have averaged much higher than in 1896. Cranberries have been our most profitable crop. The profits of the season average about as for the last ten years. The apple crop is very light and will all be disposed of in the home market.

Brewster (J. H. Clark). — Root crops are up to the usual average. Farm stock is in good condition. The weather has been too dry for fall seeding. Prices have ruled higher than the average of years. Potatoes and cranberries have been our most profitable crops and corn our least pofitable one. Considered as a whole, the season has been fairly profitable.

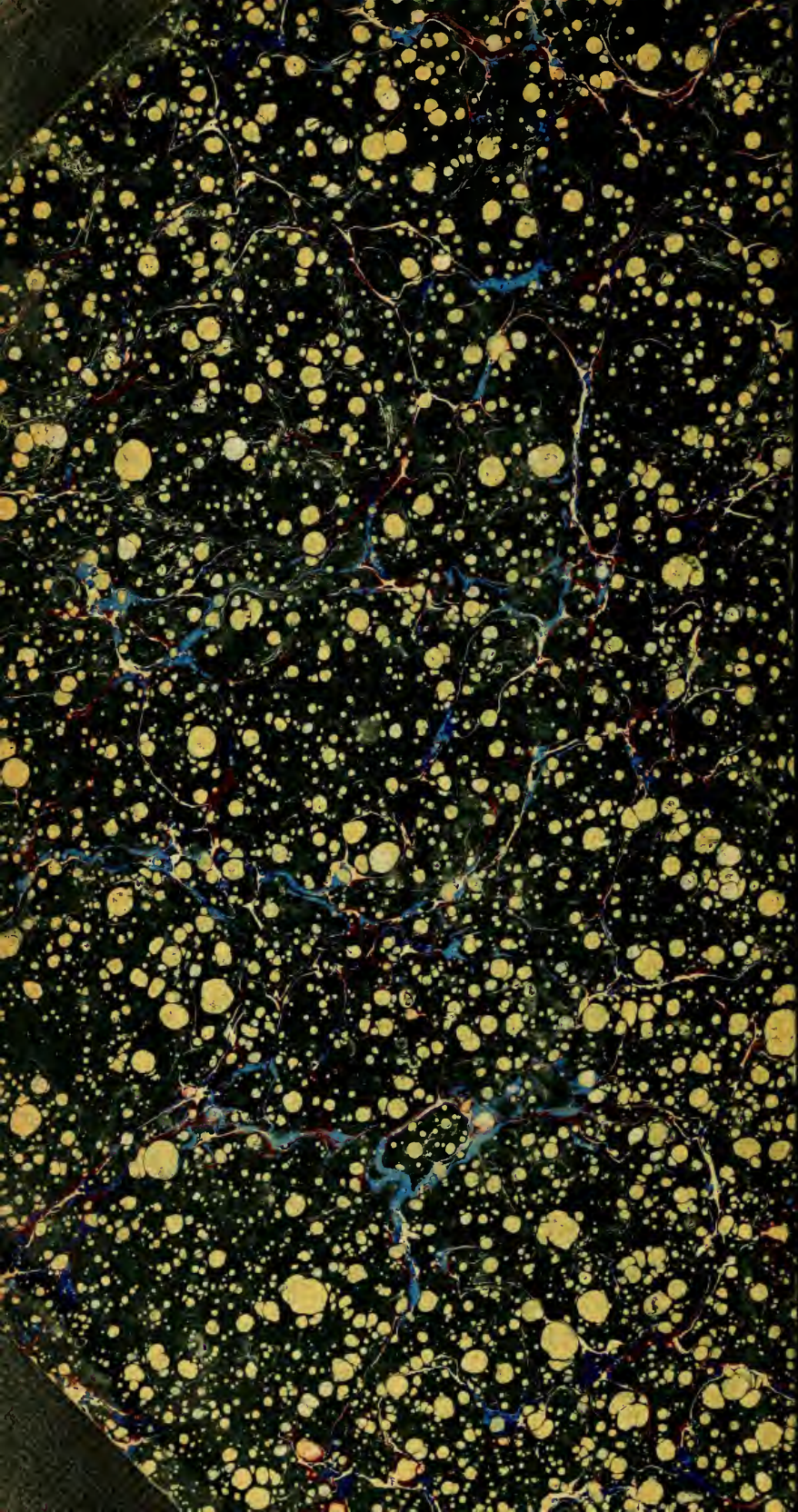
Chatham (E. Z. Ryder). — Root crops have been average. Farm stock is looking well, though pastures are in poor condition. Fall seeding is not looking well, owing to lack of rain. Farm crops have brought better prices this year than usual. Considered as a whole, the season has not been above the average for profit, owing to the failure of the potato crop. Pastures are very

dry from lack of rain. Apples are a very small crop, few orchards and few fruit trees planted.

Eastham (J. A. Clark). — As a whole, root crops are not up to the average. Farm stock is in good condition. Prices have been rather better than for the last two years. Asparagus was our most profitable crop, though it suffered from rust the last of the season. Potatoes were a good crop but the acreage was small. The season is probably an average one, as far as profit is concerned.

DUKES COUNTY.

West Tisbury (Geo. Hunt Luce). — Root crops are below average. Farm stock is in good condition. Prices for farm crops have been about average this season. Hay has been our most profitable crop and corn our least profitable one. Considered as a whole, the season has been more profitable than usual.

NANTUCKET COUNTY.

Nantucket (C. W. Gardner). — Root crops are above the usual average. Farm stock is in prime condition. It has been so dry that no fall seeding has been done. Prices have been very much lower than usual. Corn has been our most profitable crop and potatoes our least profitable one. Considered as a whole, the season has been very unprofitable. Cabbages rotted. Pumpkins and squashes have been very poor. Beans and tomatoes also failures.